SOIL SURVEY OF

Lamar, Pike, and Upson Counties, Georgia

United States Department of Agriculture
Soil Conservation Service
In cooperation with
University of Georgia, College of Agriculture
Agricultural Experiment Stations

Issued March 1972

Major fieldwork for this soil survey was done in the period 1961–67. Soil names and descriptions were approved in 1967. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1968. This survey was made cooperatively by the Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations. It is part of the technical assistance furnished to the Towaliga Soil and Water Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, USDA, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Lamar, Pike, and Upson Counties are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the three counties in alphabetic order by map symbol. It shows the capability classification for each soil and also shows the page where each soil is described.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units.

Foresters and others can refer to the section "Use of the Soils as Woodland." A table in this section shows groupings of the soils according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Community planners and others can read about soil properties that affect the choice of homesites, industrial sites, and recreation areas in the section "Use of Soils in Town and Country Planning."

Engineers and builders can find under "Use of the Soils in Engineering" tables that describe soil properties that affect engineering and show the relative suitability of soils for engineering purposes.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Lamar, Pike, and Upson Counties may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "Additional Facts About the Counties."

Cover: Farm lake in Madison-Pacolet association used for fish and wildlife.

U.S. GOVERNMENT PRINTING OFFICE: 1973

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

Contents

Issued March 1972

SOIL SURVEY OF LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA

BY HUGH T. DAVIS, SOIL CONSERVATION SERVICE

FIELDWORK BY HUGH T. DAVIS, W. S. CARSON, AND H. H. PAYNE, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE, AGRICULTURAL EXPERIMENT STATIONS

LAMAR, PIKE, AND UPSON COUNTIES, in the west-central part of Georgia (fig. 1), have a total area of 744 square miles, or 476,160 acres. The Flint River forms the western boundary of Pike and Upson Counties.

Lamar County has a total area of 181 square miles, or 115,840 acres; Pike County, 230 square miles, or 147,200 acres; and Upson County, 333 square miles, or 213,120 acres.

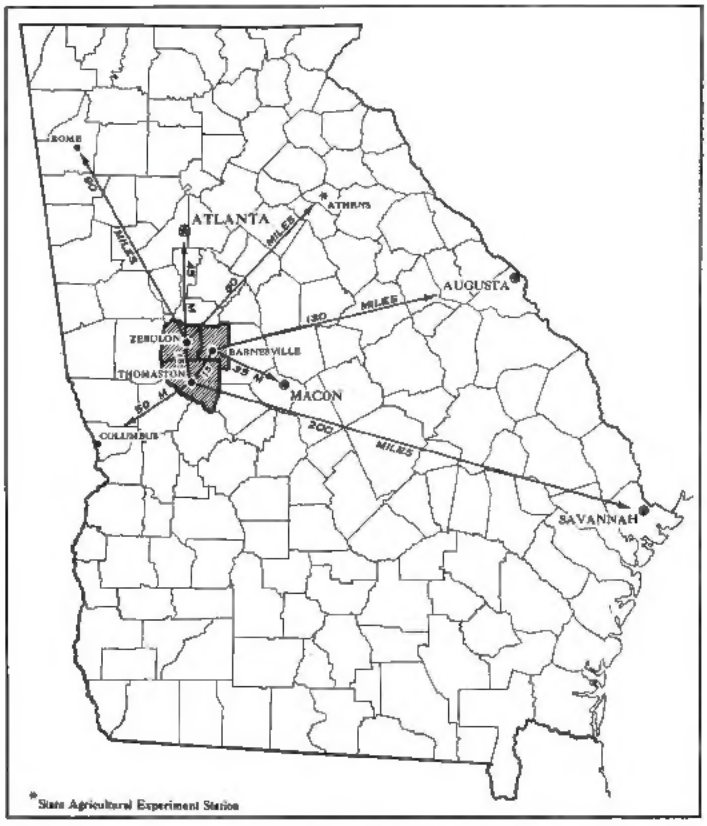


Figure 1.—Location of Lamar, Pike, and Upson Counties in Georgia.

All of the survey area is in the lower part of the Southern Piedmont Major Land Resource Area. Most of the three counties is made up of broad, gently sloping uplands. Pine Mountain, which crosses western Lamar, southern Pike, and northern Upson Counties, is strongly sloping to steep. The flood plains along the rivers and larger creeks are level or nearly level.

Most of the acreage on uplands is eroded. The surface layer in these areas is mainly sandy loam but ranges from loamy sand to sandy clay. In most places the subsoil is red sandy clay or clay. Permeability is moderate.

The soils in all three counties are suited to many kinds of crops. The climate is favorable. Summers generally are warm, and winters are only moderately cold. Precipitation generally is ample and is well distributed throughout the year. Excellent sources of water are available for industry, home, and farm use.

About 65 percent of the acreage of Lamar County is wooded; the rest is cultivated, pastured, or in other uses. Woodland covers about 61 percent of Pike County and about 82 percent of Upson County.

General farming is typical of the survey area. The production of beef cattle has increased in recent years. Dairying is not extensive. Corn, cotton, soybeans, pimento peppers, and small grains are the main crops. Peaches and pecans are important cash crops. Production of pulpwood is an expanding industry.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Lamar, Pike, and Upson Counties, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the

soil phase are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Cecil and Davidson, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Cecil sandy loam, 2 to 6 percent slopes, eroded, is one of several phases within the Cecil series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of the survey area: the soil complex and the undifferentiated group.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. Chewacla complex, occasionally flooded, is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Wilkes and Enon soils, 2 to 10 percent slopes, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Gullied land is a land type in Lamar, Pike, and Upson Counties.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, urban planners, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil survey.

Under this method, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map in the envelope inside the back cover of this survey shows, in color, the soil associations in Lamar, Pike, and Upson Counties. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in an area, who want to compare different parts of an area, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, or for choosing the site for a building or other structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

Soil associations and delineations on the general soil map in this soil survey do not fully agree with those of the general soil maps in adjacent counties published at a different date. Differences in the maps are the result of improvements in the classification of soils, particularly in the modifications or refinements in soil series concepts. In addition, more precise and detailed maps are needed because the uses of the general soil maps have expanded in recent years. The more modern maps meet this need. Still another difference is caused by the range in slope that is permitted within associations in different surveys.

Of the nine soil associations in Lamar, Pike, and Upson Counties, one consists of nearly level soils of the flood plains; five consist of very gently sloping and sloping

soils of the uplands; one of sloping and moderately steep soils of the uplands; and two chiefly of gently sloping and steep, cobbly and stony soils of the uplands. These associations are described in the following pages.

Nearly Level Soils of the Flood Plains

The soils on the alluvial flood plains are loamy and sandy and are mottled with shades of brown, yellow, and red. They lie along the major streams. Slopes range from 0 to about 2 percent. These soils are mostly wet for long periods, especially in winter and spring. Only one soil association occurs on the flood plains in Lamar, Pike, and Upson Counties.

1. Wehadkee-Chewacla-Alluvial land association

Chiefly poorly drained and somewhat poorly drained, level to nearly level soils on flood plains subject to flooding; 0 to 2 percent slopes

This association consists of alluvial materials recently deposited along flood plains of the larger streams. These soils are subject to frequent or occasional flooding that lasts for a long time in most places. Depth to the water table seldom exceeds 24 inches. The largest areas occur on the flood plains of the Little Towaliga River and Elkins, Swift, Big Potato (fig. 2), and Little Potato Creeks, but other areas occur throughout the three counties.

This association makes up about 9 percent of the survey area. Of this about 40 percent is Wehadkee soils, 26 percent is Chewacla soils, 23 percent is Alluvial land, and 11 percent is a minor soil.

Wehadkee soils are poorly drained. They have a surface layer of grayish-brown or gray silty clay loam about 4 inches thick. Below the surface layer is grayish-brown, mottled silty clay loam about 9 inches thick. The next layer is gray mottled sandy clay loam and loam.

Chewacla soils are somewhat poorly drained. They have a surface layer of brown to dark reddish-brown silty clay loam. Below this layer is dark-brown and dark reddish-brown and gray, mottled silty clay loam.

Alluvial land ordinarily is better drained than the Wehadkee and Chewacla soils, though internal drainage varies. The surface layer is chiefly dark yellowish-brown to dark reddish-brown loam or clay loam. Below this layer is chiefly mottled dark yellowish-brown, light grayish-brown, or reddish-brown, stratified sandy loam, loamy sand, and sandy clay loam.

The minor soil in this association is the sandy Buncombe soil.

Wehadkee soils are not suited to cultivated crops, because of wetness and flooding that last a long time. Chewacla soils can be cropped if drainage is established. Al-

Figure 2.—**Floodwater from Big Potato Creek covers permanent pasture in Wehadkee-Chewacla-Alluvial land association.**

luvial land is suited to cultivated crops if drained, but it is subject to occasional flooding.

The size of the farms, the kind of ownership, and the management vary widely in this association. Most of the acreage is wooded, but some areas are pastured and cultivated.

Because of the hazard of flooding, the major soils in this association have severe limitations for use as sites for homes, light industries, and cemeteries, and for other nonfarm purposes.

Very Gently Sloping and Sloping Soils of the Uplands

In the five soil associations of this group, the soils occur dominantly on ridgetops, smooth side slopes, and hillsides. Slopes mainly range from 2 to 10 percent, but in the Holston-Molena association they range from 2 to 15 percent. These soils are mostly well drained and clayey and loamy. Below the surface layer, they are dominantly red, yellowish brown, and brownish yellow. These soils generally formed in place from material that weathered from diorite, hornblende gneiss, mica schist, granite, and other rock.

2. *Cecil-Davidson-Appling association*

Well-drained soils that have red, dusky-red, or yellowish-brown clayey layers below the surface layer; on broad upland ridges; 2 to 10 percent slopes

This association is on ridgetops and side slopes. Slopes range from 2 to 6 percent on more than half the acreage and from 6 to 10 percent on the rest. The drainageways are well defined and have fairly broad flood plains. This association is widely distributed throughout the three counties.

This association occupies about 58 percent of the three counties. Of this about 56 percent is Cecil soils, 31 percent is Davidson soils, 5 percent is Appling soils, and 8 percent is minor soils.

Typically, Cecil soils have a brown sandy loam surface layer about 8 inches thick. Below the surface layer, to a depth of about 34 inches, is mainly red clay. The next layer is red clay loam about 26 inches thick. Depth to hard rock ordinarily is more than 10 feet.

The Davidson soils have a surface layer of dusky-red loam about 6 inches thick. Below the surface layer, to a depth of about 49 inches, is dusky-red clay. The next layer is dark-red sandy clay loam, which extends to a depth of about 85 inches. Depth to bedrock is greater than 10 feet.

Appling soils have a yellowish-brown sandy loam surface layer about 8 inches thick. Below the surface layer is sandy clay and clay to a depth of about 50 inches. It is yellowish brown in the uppermost part and yellowish brown mottled with yellowish red, yellow, and red in the middle and lowermost parts. Gray mottles occur below a depth of about 31 inches. Depth to bedrock is more than 8 feet in most places.

In parts of this association, small areas of the major soils are severely eroded. These areas are gullied, and clayey material is exposed.

Also in this association are the minor well-drained Madison and Pacolet soils on uplands and Alluvial land on flood plains.

In this association the soils are well suited to farming. Most of the acreage has been cleared and cultivated or pastured, though a significant area is reverting to trees. Well-suited crops are cotton, corn, small grains, and tall fescue. Many of the farms in this association are small, but some are large or very large. Most farms are operated by the owner.

The major soils in this association have only slight or moderate limitations if used as sites for homes, light industries, trafficways, and recreational facilities (fig. 3).

3. *Madison-Pacolet association*

Well-drained soils that have mainly red clayey layers below the surface layer; mostly on broad ridgetops; 2 to 10 percent slopes

This association consists of very gently sloping and gently sloping soils on ridgetops and side slopes. The drainageways are numerous and well defined, and the flood plains generally are narrow. Slopes range from 2 to 6 percent in about 75 percent of this association and from 6 to 10 percent in the rest. Most of the acreage is in the southern part of Pike County and in the northwestern part of Upson County.

This association occupies about 6 percent of the survey area. Of this about 60 percent is Madison soils, about 20 percent is Pacolet soils, and 20 percent is minor soils.

Typically, Madison soils are on fairly broad ridgetops. These soils have a surface layer of reddish-brown sandy loam about 7 inches thick. Below the surface layer is red clay loam and clay about 34 inches thick. The next layer, to a depth of about 60 inches, is red weathered mica schist. Depth to intermittent hard rock ordinarily is more than 5 feet. In a few cultivated areas, the Madison soils are severely eroded and a layer of red sandy clay loam is exposed. In these areas a few gullies have formed.

Pacolet soils occur on narrow to broad ridgetops and hillsides. These soils have a very dark grayish-brown gravelly sandy loam surface layer about 4 inches thick. The subsurface layer, about 8 inches thick, is yellow gravelly sandy loam. The next layer is mainly red clay about 21 inches thick. The underlying material, to a depth of about 50 inches, is partly weathered mica schist and sandstone. Depth to weathered and broken rock commonly is 3 to 5 feet, and hard rock ordinarily is at a depth of more than 6 feet.

Also in this association are the minor Holston and Wickham soils and Alluvial land. The Holston soils are on uplands and are well drained. The Wickham soils occur on broad ridgetops and on moderately long side slopes and are chiefly near large streams. Alluvial land is along the drainageways.

The soils in this association are suited to cultivated crops, but more than half of the acreage is wooded. Most of the farms are small and are operated by the owner. In this association the major soils have slight to moderate limitations if used as sites for homes, picnic areas, light industries, and trafficways.

Figure 3.—Farm pond used for recreation in Cecil-Davidson–Appling association. Pasture consists of bahiagrass and sericea lespedeza.

4. Pacolet-Appling association

Well-drained soils that have dominantly a red and yellowish-brown clayey layer below the surface layer; on uplands; 2 to 10 percent slopes

This association is dissected by many, narrow, well-defined drainageways. Slopes are short, and rock crops out in a few small areas on steeper slopes. Slopes range from 2 to 6 percent on about half of the acreage and from 6 to 10 percent on the rest. This association occurs only in the northwestern part of Pike County.

This association occupies about 2 percent of the survey area. Of this about 66 percent is Pacolet soils, about 25 percent is Appling soils, and 9 percent is minor soils.

The Pacolet soils are on the rougher parts of the association. These soils have a surface layer of a very dark grayish-brown gravelly sandy loam about 4 inches thick. The subsurface layer, about 8 inches thick, is yellow gravelly sandy loam. The next layer is mainly red clay about 21 inches thick. The underlying material is mica schist and pockets of clay loam. Depth to fragments of weathered and broken rock commonly is 3 to 5 feet, but hard rock ordinarily is at a depth of more than 6 feet.

Appling soils are on the smoother parts of the landscape. Their surface layer is yellowish-brown sandy loam about 8 inches thick. Below the surface layer, to a depth of about 50 inches, is clay or sandy clay loam. It is yellowish brown in the upper part and yellowish brown mottled with yellowish red, yellow, and red in the middle and lower parts. In most places depth to hard rock is more than 8 feet.

The minor soils in the association are the Cecil, Louisburg, and Helena soils, all of which are on uplands.

The soils of this association are rougher and more dissected than those in the adjoining Cecil-Davidson-Appling association and are not so well suited to farming. The smoother slopes of the Pacolet-Appling association can be farmed; only a few areas are severely eroded. Farms are of about average size and ordinarily are operated by the owner.

The major soils of this association generally have slight or moderate limitations if used as sites for homes, light industries, septic tank filter fields, and trafficways.

5. Appling-Helena association

Well drained and moderately well drained soils that have mainly a yellowish-brown, mottled clayey layer below the surface layer; on uplands; 2 to 6 percent slopes

This association consists of very gently sloping soils on broad, smooth ridgetops that are dissected by drainageways. The association occurs only in Lamar County. One of the largest areas is near Milner in the west-central part of the county.

This association covers about 3 percent of the survey area. Of this about 55 percent is Appling soils, 25 percent is Helena soils, and 20 percent is minor soils.

Appling soils occupy slightly higher positions than Helena soils and are well drained. Appling soils have a surface layer of yellowish-brown, friable sandy loam about 8 inches thick. Below the surface layer is clay or sandy clay, which extends to a depth of about 50 inches. This layer is yellowish brown in the uppermost part and yellowish brown mottled with yellowish red, yellow, and red in the middle and lowermost parts. In most places depth to hard rock is more than 8 feet.

Helena soils occur chiefly at the base of slopes and around the heads of drainageways in slight depressions. They are moderately well drained. These soils have a surface layer of light brownish-gray sandy loam about 8 inches thick. Below the surface layer is olive-yellow sandy clay loam about 5 inches thick. The next layer, to a depth of about 52 inches, is yellowish-brown clay and sandy clay mottled with pinkish gray, brownish yellow, and strong brown in the lower part. Depth to hard rock generally is 4 to 6 feet.

The Cecil, Madison, and Starr soils occur in small areas.

The soils in this association are well suited to cultivated crops. The response to management is good.

About half of the acreage is cultivated or pastured. Some of the largest pecan orchards in the survey area are in this association. Most of the farms are of average size and are operated by the owners.

The major soils of this association generally have slight to severe limitations for use as sites for homes, septic tank filter fields, trafficways, and sewage lagoons, and for other nonfarm uses.

6. Holston-Molena association

Well-drained and somewhat excessively drained soils that have a yellowish-brown to yellowish-red loamy and sandy layer below the surface layer; on uplands; 2 to 10 percent slopes

This association consists of very gently sloping and gently sloping soils on fairly broad, smooth landscapes. It occurs only in Pike County, where it is in the western and southern parts.

This association occupies about 2 percent of the three counties. Of this about 43 percent is Holston soils, 22 percent is Molena soils, and 35 percent is minor soils.

The Holston soils formed in old alluvial or colluvial material that came from the higher uplands. These soils have a surface layer of yellowish-brown sandy loam about 5 inches thick. Below the surface layer is sandy clay loam about 55 inches thick. It is yellowish brown in the uppermost part, yellowish brown mottled with red in the middle, and yellowish brown mottled with red and light brownish gray in the lowermost part. Depth to bedrock ordinarily is 4 to 6 feet.

The Molena soils are somewhat excessively drained and occur on smooth slopes, ridgetops, and side slopes. These soils have a surface layer of reddish-brown loamy sand about 7 inches thick. Below the surface layer is yellowish-red loamy sand about 44 inches thick. Underlying this, to a depth of 60 inches or more, is yellowish-red coarse sand. Depth to hard rock ordinarily is more than 15 feet.

Minor soils in the association are the Cecil, Wickham, and Davidson soils on uplands and Alluvial land on bottom land.

The soils in this association are suited to farming, and about 60 percent of the acreage is used for cultivated crops or pasture. The rest is mainly wooded. Farms are of about average size for the three counties.

The major soils in the association have slight to moderate limitations for use as sites for homes, picnic areas, and golf fairways, and for other nonfarm purposes.

Sloping and Moderately Steep Soils of the Uplands

The sloping and moderately steep soils of the uplands are in one association. They are well drained and occur mainly on wooded hillsides and narrow ridgetops. Slopes range from 10 to 25 percent. These soils are dominantly dusky red and red below the surface layer and are clay or clay loam. They formed in place from material derived from diorite, granite, gneiss, mica schist, and other rock.

7. Davidson-Cecil-Madison association

Well-drained soils that have a dusky-red to red, clayey layer below the surface layer; on narrow upland ridgetops and hillsides; 10 to 25 percent slopes

This association consists of sloping to moderately steep soils on hillsides and rough, narrow ridgetops. Slopes range from 10 to 15 percent in about two-thirds of the association and from 15 to 25 percent in the rest. The soils are severely eroded in many areas. The larger areas are in Upson County. The smaller areas are in the western part of Pike County and the eastern and southwestern parts of Lamar County.

This association occupies about 13 percent of the three counties. Of this about 45 percent is Davidson soils, 32 percent is Cecil soils, 15 percent is Madison soils, and 8 percent is minor soils.

The Davidson soils have a surface layer of dusky-red clay loam about 4 to 6 inches thick. Below the surface layer is dusky-red clay about 43 inches thick. The next layer, to a depth of about 85 inches, is dark-red sandy clay loam. Depth to bedrock is more than 10 feet.

The Cecil soils have a surface layer of yellowish-red sandy clay loam about 4 inches thick. Below the surface layer is mainly red clay about 26 inches thick. The next layer, to about 60 inches, is red clay loam. Depth to bedrock is more than 10 feet.

The Madison soils have a surface layer of reddish-brown or yellowish-red sandy clay loam about 4 to 6 inches thick. Below the surface layer is mainly red clay about 20 to 40 inches thick. The underlying material is mainly red, weathered mica schist. Hard rock ordinarily is at a depth of more than 5 feet.

Minor soils in this association are the Louisburg and Wilkes soils on uplands.

Most of the acreage has been cleared and cultivated, but it mostly is reverting to woodland, for which it is suited. Because tilth is poor and the hazard of erosion is severe, these soils are poorly suited to cultivated crops.

The major soils of this association generally have slight to severe limitations for use as sites for homes,

light industries, and sewage lagoons, and for other nonfarm purposes. The limitations vary according to soil characteristics, such as slope, erosion, and amount of clay in the surface layer and subsurface layer.

Chiefly Gently Sloping and Steep, Cobbly and Stony Soils of the Uplands

In the two soil associations of this group, the soils are mainly gently sloping and steep. They occur on ridgetops and side slopes. Slopes range from 2 to 45 percent. These well-drained soils are mainly shallow or moderately deep to weathered rock. The surface layer ranges from cobbly fine sandy loam to stony loam and sandy loam. Below the surface layer the color ranges from red through yellowish red, dark brown, dark yellowish brown, and brownish yellow. The texture is mainly clay and sandy clay loam. These soils formed in material weathered in place from hornblende gneiss, mica schist, granite, sandstone, and other rock.

8. Mountainburg-Pacolet association

Well-drained, mainly cobbly soils that have yellowish red to red, loamy and clayey layers below the surface layer; on uplands; 10 to 45 percent slopes

This association consists of ridgetops and side slopes. The soils are cobbly and gravelly. In some areas, hard rock is at a depth of less than 30 inches, but in a few areas, hard rock is at the surface. The drainageways are well defined. Slopes range from 15 to 45 percent in about three-fourths of the association, and from 10 to 15 percent in the rest. Most of this association is in the central part of Lamar County, in the southern part of Pike County, and in the northwesten part of Upson County.

This association occupies about 4 percent of the survey area. Of this about 70 percent is Mountainburg soils, 20 percent is Pacolet soils, and 10 percent is minor soils.

The sloping to steep Mountainburg soils occur on the narrow ridgetops and hillsides. Typically, these soils have a surface layer of very dark gray cobbly fine sandy loam about 4 inches thick. Below the surface layer is yellowish-red gravelly sandy clay loam about 10 inches thick. The next layer, to a depth of about 20 inches, is reddish sandstone fragments and quartzite pebbles in which pockets of red sandy clay loam occur. In most places horizontally bedded sandstone is at a depth of 20 inches or less.

Pacolet soils are on the less sloping part of the landscape. These soils have a surface layer of very dark grayish-brown gravelly sandy loam about 4 inches thick. The subsurface layer, about 8 inches thick, is yellow gravelly sandy loam. The next layer, to a depth of 33 inches, is mainly red clay. The underlying material is weathered mica schist and pockets of clay loam. Depth to hard rock generally is more than 6 feet.

The Madison and Wickham are minor soils in this association. These soils are well drained and occur on uplands.

The soils in this association are mostly wooded. Most of the areas are too steep for farming, especially for cultivated crops. The farms in this association vary from small to large in size. Most farms are privately owned.

The steeper soils in the higher areas have severe limitations if used as sites for foundations for homes, septic tank filter fields, sewage lagoons, and light industries. Limitations to these uses vary in the lower areas and more nearly level parts.

9. Wilkes-Enon association

Mainly shallow, well-drained soils that have yellowish-brown and dark yellowish-brown loamy and clayey layers below the surface layer; on uplands; 2 to 25 percent slopes

This association consists of very gently sloping to steep soils on narrow ridgetops and side slopes that are dissected by numerous well-defined drainageways. Slopes range from 10 to 25 percent throughout about two-thirds of the association, and from 2 to 10 percent in the rest. In most areas rock outcrops and stones commonly are on the surface. This association is mainly along the Flint River in the southern part of Upson County.

This association makes up about 3 percent of the survey area. Of this about 62 percent is Wilkes soils, 26 percent is Enon soils, and 12 percent is minor soils.

The Wilkes soils have a surface layer of very dark grayish-brown fine sandy loam about 2 inches thick. Below the surface layer is dark-brown and dark yellowish-brown sandy clay loam about 16 inches thick. The underlying material is dark-brown, green and gray, soft, weathered rock. Depth to partly weathered hard rock is about 18 inches. Stones cover the surface and appear throughout the solum in many areas.

The Enon soils have a grayish brown fine sandy loam surface layer about 4 inches thick. The next layer, about 44 inches thick, consists of clay and clay loam. The uppermost 6 inches is brownish-yellow clay loam. The middle part is about 12 inches of yellowish-brown clay that is mottled with strong brown and red. The lowermost part is about 26 inches thick and is light olive-brown clay loam. The underlying material is weathered rock mixed with clay loam.

Minor soils in this association are the Davidson and Chewacla. The Davidson soils are well-drained, dusky-red, clayey soils on uplands, and Chewacla soils are somewhat poorly drained mottled soils on flood plains.

Within this association, a few small areas are severely eroded. In these areas, many small gullies and a few large ones have formed.

The soils of this association are poorly suited to cultivated crops. More than three-fourths of the acreage is wooded; the rest is pastured, cultivated, or idle. Because of steep slopes, stones, and shallowness, these soils are poorly suited to cultivation. Most of the farms in this association are of medium size, but a few are large. These farms are generally operated by the owner.

Wilkes and Enon soils of this association generally have severe limitations for use as sites for light industries, sewage lagoons, cemeteries, and sanitary landfills, and for similar nonfarm uses.

Descriptions of the Soils

This section describes the soil series and mapping units in Lamar, Pike, and Upson Counties. The approximate acreage and proportionate extent of such mapping units

409-416—72 -2

are given in table 1. Their location is shown on the soil map at the back of this survey.

The procedure in this section is first to describe the soil series, and then the mapping units in the series. Thus, to get full information on any one mapping unit, it is necessary to read the description of that unit and also the description of the soil series to which it belongs. The description of the soil series mentions features that apply to all the soils in a series. Differences among the soils of one series are pointed out in the description of the individual soils or are indicated in the soil name.

A profile typical for each series is described in two ways. Many will prefer to read the short description in narrative form. It is the second paragraph in the series description. The technical description of the profile is mainly for soil scientists, engineers, and others who need to make thorough and precise studies of soils. Unless otherwise stated, the colors described are those of a moist soil.

As mentioned in the section "How This Survey was Made," not all mapping units are members of a soil series. Gullied land, for example, is a land type that does

TABLE 1. *Approximate acreage and proportionate extent of the soils*

Soil	Lamar County		Pike County		Upson County		Total acres	Total percent
	Area	Extent	Area	Extent	Area	Extent		
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*		
Alluvial land	2, 150	1. 8	2, 675	1. 8	5, 320	2. 5	10, 145	2. 1
Altavista sandy loam, 2 to 6 percent slopes	338	. 3	534	. 4	520	. 2	1, 392	. 3
Appling sandy loam, 2 to 6 percent slopes	3, 245	2. 8	3, 605	2. 5	2, 395	1. 1	9, 245	1. 9
Appling sandy loam, 6 to 10 percent slopes	2, 385	2. 1	2, 960	2. 0	865	. 4	6, 210	1. 3
Appling sandy clay loam, 2 to 6 percent slopes, severely eroded	1, 710	1. 5	3, 130	2. 1	600	. 3	5, 440	1. 1
Appling sandy clay loam, 6 to 10 percent slopes, severely eroded	935	. 8	1, 165	8	585	. 3	2, 685	. 6
Buncombe loamy sand	0	0	150	. 1	1, 100	. 5	1, 250	. 3
Cecil sandy loam, 2 to 6 percent slopes, eroded	17, 677	15. 3	20, 864	14. 2	4, 165	2. 0	42, 706	9. 0
Cecil sandy loam, 6 to 10 percent slopes, eroded	16, 264	14. 0	19 23o	13. 1	2, 960	1. 4	38, 459	8. 1
Cecil sandy loam, 10 to 25 percent slopes	805	. 7	1, 000	. 7	1, 410	. 7	3, 215	. 7
Cecil sandy loam, 10 to 25 percent slopes, eroded	3, 265	2. 8	3, 895	2. 7	3, 510	1. 6	10, 670	2. 2
Cecil sandy clay loam, 2 to 6 percent slopes, severely eroded	17, 109	14. 8	20, 076	13. 7	4, 390	2. 1	41, 575	8. 7
Cecil sandy clay loam, 6 to 15 percent slopes, severely eroded	15, 820	13 7	19, 883	13. 5	10, 390	4. 9	46, 093	9. 7
Chewacla complex, occas.onally flooded	710	. 6	875	. 6	1, 840	. 9	3, 425	. 7
Chewacla and Wehadkee soils, frequently flooded	1, 845	1. 6	2, 280	1. 5	7, 130	3. 3	11, 255	2. 4
Davidson loam, 2 to 6 percent slopes	2, 190	1. 9	2, 675	1. 8	13, 385	6. 3	18, 250	3. 8
Davidson loam, 6 to 10 percent slopes, eroded	1, 515	1. 3	1, 985	1. 3	5, 800	2. 7	9, 300	2. 0
Davidson loam, 10 to 15 percent slopes, eroded	1, 195	1. 0	1, 595	1. 1	6, 135	2. 9	8, 925	1. 9
Davidson clay loam, 2 to 6 percent slopes, severely eroded	2, 400	2. 1	2, 985	2. 0	22, 368	10. 5	27, 753	5. 8
Davidson clay loam, 6 to 10 percent slopes, severely eroded	2, 320	2. 0	2, 885	2. 0	29, 828	14. 0	35, 033	7. 4
Davidson clay loam, 10 to 25 percent slopes, severely eroded	1, 250	1. 1	2, 690	1. 8	25, 094	11. 8	29, 034	6. 1
Gullied land	70	. 1	95	. 1	350	. 2	515	. 1
Helena sandy loam, 2 to 6 percent slopes	1, 362	1 2	936	. 6	1, 360	. 6	3, 658	. 8
Holston sandy loam, 2 to 6 percent slopes	280	. 2	1, 665	1. 1	2, 040	1. 0	3, 985	. 8
Holston sandy loam, 6 to 15 percent slopes	210	. 2	1, 350	. 9	2, 580	1. 2	4, 140	. 9
Louisburg stony soils, 6 to 15 percent slopes	1, 055	. 9	1, 650	1. 1	845	. 4	3, 550	7
Madison sandy loam, 2 to 6 percent slopes, eroded	1, 620	1. 4	1, 200	. 8	1, 715	. 8	4, 535	1. 0
Madison sandy loam, 6 to 10 percent slopes, eroded	1, 235	1. 1	1, 000	. 7	1, 885	. 9	4, 120	. 9
Madison sandy loam, 10 to 15 percent slopes, eroded	220	. 2	770	. 5	2, 250	1. 1	3, 240	. 7
Madison sandy loam, 15 to 25 percent slopes	130	. 1	355	. 2	495	. 2	980	. 2
Madison sandy clay loam, 2 to 6 percent slopes, severely eroded.	1, 725	1. 5	1, 340	. 9	2, 525	1. 2	5, 590	1. 2
Madison sandy clay loam, 6 to 15 percent slopes, severely eroded.	1, 890	1. 6	1, 460	1. 0	6, 510	3. 0	9, 860	2. 1
Molena loamy sand, 2 to 10 percent slopes	0	0	2, 165	1. 4	40	(1)	2, 145	. 4
Mountainburg cobbly fine sandy loam, 15 to 45 percent slopes	790	. 7	3, 865	2. 6	9, 830	4. 6	14, 485	3. 0
Pacolet stony loam, 2 to 6 percent slopes	1 180	1. 0	1, 470	1. 0	100	(1)	2, 750	. 6
Pacolet stony loam, 6 to 10 percent slopes	1, 053	. 9	1, 288	. 9	490	. 2	2, 831	. 6
Pacolet gravelly sandy loam, 2 to 6 percent slopes	373	. 3	946	. 6	2, 085	1. 0	3, 404	. 7
Pacolet gravelly sandy loam, 6 to 15 percent slopes	534	. 5	2, 503	1. 7	5, 540	2. 6	8, 577	1. 8
Rock land	35	(1)	50	(1)	65	(1)	150	(1)
Starr soils	700	. 6	185	. 1	2, 380	1. 1	3, 265	. 7
Wehadkee silty clay loam, frequently flooded	2 340	2. 0	1, 470	1 0	90	(1)	3, 900	. 8
Wehadkee soils, frequently flooded	3, 410	2. 9	4, 025	2. 8	5, 950	2. 8	13, 385	2. 8
Wickham gravelly sandy loam, 2 to 6 percent slopes	30	(1)	100	. 1	435	. 2	565	. 1
Wickham gravelly sandy loam, 6 to 10 percent slopes	80	. 1	130	. 1	405	. 2	615	. 1
Wilkes and Enon soils, 2 to 10 percent slopes	390	. 3	100	. 1	5, 330	2. 5	5, 820	1. 2
Wilkes and Enon soils, 10 to 25 percent slopes	0	0	0	0	8, 035	3. 8	8, 035	1. 7
Total	115, 840	100. 0	147, 200	100. 0	213, 120	100. 0	476, 160	100. 0

[1] Less than 0.1 percent.

not belong to a soil series. It is listed, nevertheless, in alphabetic order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland suitability group in which the mapping unit has been placed. The "Guide to Mapping Units" at the back of this survey lists the pages where each of these groups is described.

Many terms used in the soil descriptions and other sections are defined in the Glossary at the back of this survey and in the Soil Survey Manual *(9)*.[1]

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those of the detailed soil maps in nearby counties published at a different date. Differences are the result of better knowledge of soils, modifications in series concepts, intensity of mapping, and the extent of soils in the survey area. In some places, it is more feasible to combine small acreages of similar soils that respond in much the same way to use and management than it is to separate them.

Alluvial Land

Alluvial land (Alm) consists of well drained and moderately well drained, recent alluvium deposited on long, narrow flood plains. These areas are nearly level. They are generally stratified and vary from place to place but are commonly loam or clay loam. In some areas the surface layer is sandy loam or sandy clay loam. It is mainly dark yellowish brown, dark reddish brown, and brown to a depth of about 20 inches and reddish brown, brown, light grayish brown, and dark red below this depth. Mottles of gray and grayish brown occur below a depth of about 30 inches in most areas. Small mica flakes are common throughout.

Included in mapping were narrow strips of sandy, excessively drained Buncombe soil along streambanks and a few spots of moderately wet and wet soils.

The soils making up this land type are strongly acid, moderate to low in fertility, and low in organic-matter content. The available water capacity varies. Permeability is moderately slow to moderately rapid, and surface runoff is slow. Tilth is generally good.

Alluvial land occurs as scattered areas throughout the three counties. It generally occurs with Buncombe, Chewacla, and Wehadkee soils. In contrast with these soils, it is stratified with coarse-textured and fine-textured material to a depth of about 20 inches.

Alluvial land is not subject to erosion, but it is subject to scouring and occasional flooding. It can be farmed intensively and planted to row crops year after year. Moisture normally is adequate for good growth of pasture, hay, and other crops. More than half the acreage is cultivated or pastured. Wooded areas are chiefly sweetgum, yellow-poplar, mixed oaks, and loblolly pine. (Capability unit IIw 2; woodland suitability group 1o7)

Altavista Series

The Altavista series consists of moderately well drained soils that formed in old alluvium. These nearly level and very gently sloping soils occur mainly on narrow low stream terraces, but small areas are adjacent to flood plains along creeks and other large streams. Slopes range from 2 to 6 percent. Individual areas range from 5 to 15 acres in size.

In a representative profile, the surface layer is grayish-brown sandy loam about 8 inches thick. The subsurface layer is pale-olive sandy loam about 4 inches thick. Below this is a layer of mainly sandy clay loam to a depth of about 44 inches. It is brownish yellow mottled with white, strong brown, and yellowish brown in the upper part and is light brownish gray mottled with yellowish brown, strong brown, and yellowish red in the lower part. Depth to hard rock is more than 5 feet.

These soils have low natural fertility and a low content of organic matter. They are strongly acid. Permeability is moderate, and the available water capacity is medium.

Altavista soils are suited to a wide range of locally grown crops and can be farmed intensively. They respond well to good management. About 75 percent of the acreage is cultivated or pastured; the rest is wooded or idle. The dominant trees are sweetgum, blackgum, yellow-poplar, mixed oaks, and pine.

Representative profile of Altavista sandy loam, 2 to 6 percent slopes, in a pasture:

Ap—0 to 8 inches, grayish brown (2.5Y 5/2) sandy loam; weak, fine, granular structure; very friable; few quartz pebbles; many roots; strongly acid; abrupt, smooth boundary

A2—8 to 12 inches, pale-olive (5Y 6/4) sandy loam; weak, fine, granular structure; very friable; many roots; strongly acid; clear, smooth boundary

B1t—12 to 23 inches, brownish-yellow (10YR 6/6) light sandy clay loam; weak, medium, subangular blocky structure; very friable; clay bridging between sand grains; many roots; strongly acid; gradual, wavy boundary

B21t—23 to 36 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, medium, distinct mottles of white (10YR 8/2), strong brown (7.5YR 5/8), and yellowish brown (10YR 5/8); moderate, medium, subangular blocky structure; friable; clay bridging between sand grains; few quartz pebbles; many fine roots; strongly acid; gradual, wavy boundary.

B22t 36 to 52 inches, light brownish-gray (2.5Y 6/2) light sandy clay loam; many, coarse, prominent pebbles of yellowish brown (10YR 5/8), strong brown (7.5YR 5/8), and yeLowish red (5YR 5/6); moderate, medium, subangular blocky structure; friable; clay bridging between sand grains and clay films in old root channels; many fine roots; strongly acid.

The Ap horizon ranges from sandy loam to fine sandy loam in texture and from grayish brown to yellowish brown in color. The Bt horizon is sandy clay loam to clay loam in texture and is strong brown or brownish yellow to pale olive in color. The clay content ranges from 18 to 35 percent. Mottles that have chroma of 2 or less begin at a depth of about 23 inches. The solum ranges from 38 to 60 inches in thickness.

Altavista soils occur mainly with Appling soils and Alluvial land. They are less clayey than Appling soils and are not so well drained. Their texture is less variable than that of Alluvial land.

Altavista sandy loam, 2 to 6 percent slopes (AlB). - This is the only Altavista soil mapped in the survey area. It is subject to extremely brief periods of flooding during winter and spring.

Included with this soil in mapping were small areas of Appling and Chewacla soils.

This Altavista soil is well suited to farming and is suited to most crops commonly grown. Crops respond well if management is good. Most of the acreage is cultivated

[1] Italic numbers in parentheses refer to Literature Cited, p. 65.

or pastured; the rest is idle or wooded. (Capability unit IIe–2; woodland suitability group 2w8)

Appling Series

The Appling series consists of well-drained soils that formed in material weathered from granite, gneiss, and mica schist. These soils are in the uplands on broad ridgetops and hillsides. They occur as scattered areas throughout the survey area. Slopes range from 2 to 10 percent.

In a representative profile in the less eroded areas, the surface layer is yellowish-brown sandy loam about 8 inches thick. Below this, to a depth of about 50 inches, is clay or sandy clay that is yellowish brown in the uppermost part and yellowish brown mottled with yellowish red, yellow, and red in the middle and lowermost parts. A few gray mottles occur below a depth of about 31 inches. Depth to hard rock is more than 8 feet in most places.

These soils have low natural fertility and a low content of organic matter. They are strongly acid. Permeability is moderate, and the available water capacity is medium.

Appling soils are well suited to farming, and more than half the acreage is cultivated or pastured. The chief trees are white oak, post oak, red oak, and hickory. Sweetgum, yellow-poplar, and loblolly pine grow in places.

Representative profile of Appling sandy loam, 6 to 10 percent slopes, in a cultivated field:

Ap—0 to 8 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; very friable; many fine roots and some quartz pebbles; strongly acid; abrupt, smooth boundary.

B1t—8 to 11 inches, yellowish-brown (10YR 5/8) sandy clay; weak, medium, subangular blocky structure; friable; common roots and a few quartz pebbles; few clay films on ped surfaces; strongly acid; gradual, wavy boundary.

B21t—11 to 31 inches, yellowish-brown (10YR 5/8) clay; few, fine, distinct mottles of yellowish red (5YR 5/8) and yellow (10YR 7/6); moderate, medium, angular and subangular blocky structure; firm; clay films on most ped surfaces; strongly acid; gradual, wavy boundary.

B22t—31 to 50 inches, yellowish-brown (10YR 5/8) clay; many, medium, prominent mottles of yellowish red (5YR 5/8) and red (2.5Y 5/8); few, fine, distinct, light-gray (10YR 7/2) mottles in lower part; moderate, medium, angular and subangular blocky structure; firm; clay films on most ped surfaces; few pebbles; strongly acid.

In areas that are not severely eroded, the Ap horizon is sandy loam 4 to 10 inches thick. It ranges from dark grayish brown and olive brown to yellowish brown in color. In severely eroded areas, the Ap horizon is brown and yellowish-brown or yellowish-red sandy clay loam. In much of the acreage, the B1t horizon is yellowish-brown, strong-brown, or yellowish-red sandy clay loam to sandy loam 3 to 8 inches thick. The B2t horizon ranges from yellowish brown through yellowish red in matrix color and from clay to sandy clay in texture. It is distinctly or prominently mottled with red, strong brown, or yellow. The solum ranges from 40 to about 60 inches in thickness.

Appling soils occur mainly with Cecil, Pacolet, Helena, and Madison soils. They are not so red in the B horizon as Cecil and Pacolet soils. They are better drained than Helena soils. They contain less mica than Madison soils.

Appling sandy loam, 2 to 6 percent slopes (AmB).—This well-drained soil is on uplands. Most areas range from 2 to 30 acres in size. The surface layer is dark grayish-brown or yellowish-brown sandy loam 8 to about 10 inches thick. The next layer is yellowish-brown or yellowish-red sandy clay loam or sandy clay 4 to 6 inches thick. Below this, to a depth of 40 to 60 inches, is strong-brown or yellowish-red sandy clay or clay mottled with yellowish brown through red.

Included with this soil in mapping were small areas of Cecil soils.

This Appling soil is well suited to cultivation. Erosion is a slight to moderate hazard in areas where runoff is rapid. About half the acreage is cultivated or pastured; the rest is wooded or idle. (Capability unit IIe–2; woodland suitability group 3o7)

Appling sandy loam, 6 to 10 percent slopes (AmC).—This soil generally occurs as narrow bands between ridgetops and drainageways. It has the profile described as representative of the Appling series. Most areas range from 3 to 10 acres in size.

Included with this soil in mapping were areas of Cecil and Holston soils and areas of soils that are similar to this soil but are sandy clay loam below the surface layer.

This Appling soil is moderately well suited to cultivation. Erosion is a moderate to severe hazard. About half the acreage is cultivated; the rest is pastured, wooded, or idle. (Capability unit IIIe–2; woodland suitability group 3o7)

Appling sandy clay loam, 2 to 6 percent slopes, severely eroded (AnB3).—This well-drained soil is on uplands. Most areas are only a few acres in size. Except for the plow layer, this soil has a profile similar to the one described as representative for the Appling series. The plow layer is yellowish-brown, brown, or yellowish-red sandy clay loam 4 to 6 inches thick. Galled areas and shallow gullies that expose yellowish-brown sandy clay are common in some areas.

Included with this soil in mapping were areas in which the original surface layer has been removed for road fill.

Over most of the acreage, tilth is poor and infiltration is slow. Runoff is rapid, and the erosion hazard is severe if this soil is cultivated and not protected. Crop response is only fair if management is good. All of the acreage has been cleared and farmed, though much of it now is in mixed pine forest and pasture (fig. 4). (Capability unit IIIe–2; woodland suitability group 4c2e)

Appling sandy clay loam, 6 to 10 percent slopes, severely eroded (AnC3).—This well-drained soil is on uplands. Most areas range from 3 to 6 acres in size. They generally are adjacent to drainageways. Except for a thinner surface layer, the profile of this soil is similar to the one described as representative of the Appling series. The surface layer is yellowish-brown, brown, or yellowish-red sandy clay loam about 3 inches thick. It is mainly a mixture of the upper part of the underlying material and remnants of the original surface layer. Shallow gullies have formed, and in some places yellowish-brown sandy clay or clay is exposed.

This soil has limited suitability for cultivation but is fairly well suited to pasture. Most of the acreage is wooded. (Capability unit IVe–1; woodland suitability group 4c2e)

Figure 4.—Stockwater pond in a fescue pasture. The soil is Appling sandy clay loam, 2 to 6 percent slopes, severely eroded.

Buncombe Series

In the Buncombe series are nearly level, sandy soils that are excessively drained. These soils are on first bottoms in long, narrow areas generally adjacent to rivers and other large streams. The alluvium in which the soils formed was derived mainly from areas underlain by granite, gneiss, schist, and other siliceous igneous rocks.

In a representative profile, the surface layer is yellowish-red loamy sand about 8 inches thick. The subsurface layer is strong-brown loamy sand about 6 inches thick. Below is stratified yellowish-red and reddish-brown loamy fine sand and loamy coarse sand that reaches to a depth of about 52 inches.

These soils have low natural fertility and a low content of organic matter. They are very strongly acid to medium acid. Infiltration and permeability are rapid, and the available water capacity is low. The surface layer is in good tilth. Droughtiness is a hazard in cultivated areas.

About 30 percent of the acreage is cultivated or pastured; the rest is wooded or idle. Yellow-poplar, sycamore, sweetgum, beech, and loblolly pine are the chief trees.

Representative profile of Buncombe loamy sand, under native weeds and broomsedge:

Ap—0 to 8 inches, yellowish-red (5YR 4/6) loamy sand; structureless; loose; very friable; many fine roots; few fine mica flakes; very strongly acid; abrupt, smooth boundary.

A2—8 to 14 inches, strong-brown (7.5YR 5/6) loamy sand; structureless; loose; many fine roots; few fine mica flakes; very strongly acid; gradual, wavy boundary.

C1—14 to 26 inches, yellowish-red (5YR 4/6) loamy fine sand; structureless; loose; many fine roots; few fine mica flakes; very strongly acid; gradual, wavy boundary.

C2—26 to 52 inches, reddish-brown (5YR 5/4) loamy coarse sand; structureless; loose; a few thin bands of sandy loam; many fine roots; few fine mica flakes; very strongly acid

The Ap horizon is yellowish-red or dark-brown loamy sand and is generally 6 to 8 inches thick unless scoured and shifted by floodwater. The C horizon ranges from yellowish-red through yellowish brown loamy sand, loamy fine sand, or loamy coarse sand to a depth of more than 52 inches. Mica flakes are common throughout the profile. There are no mottles that have chroma of 2 or less within a depth of 40 inches.

Buncombe soils occur mainly with Chewacla and Wehadkee soils. They are sandier and better drained than those soils.

Buncombe loamy sand (Bfs).—This is the only Buncombe soil mapped in Lamar, Pike, and Upson Counties. It formed in alluvium on first bottoms along the Flint River and the larger creeks. It occurs as natural levees adjacent to stream channels. Slopes are 0 to about 2 percent.

Included with this soil in mapping were small areas of a similar soil that has a loamy texture.

This Buncombe soil is in good tilth. Infiltration is rapid, and runoff is slow. The water table is at a depth of more than 60 inches.

This soil is subject to flooding in winter and spring. Droughtiness in summer, low fertility, and the overflow hazard limit the suitability of this soil for cultivated crops. (Capability unit IIIs–1; woodland suitability group 2s8)

Cecil Series

The Cecil series consists of well-drained soils that formed in material weathered in place from granite, gneiss, and mica schist. These soils are on broad to narrow ridgetops and long hillsides. Slopes range from 2 to 25 percent. The areas are large and are scattered throughout the survey area.

In a representative profile in the less eroded areas, the surface layer is brown sandy loam about 8 inches thick. Below this is mainly red clay to a depth of about 34 inches. The next layer is red clay loam about 26 inches thick. The underlying material, to a depth of about 65 inches, is red sandy clay loam. Depth to hard rock is commonly more than 10 feet.

These soils have low natural fertility and a low content of organic matter. They are very strongly acid to strongly acid. Permeability is moderate, and the available water capacity is medium.

The native vegetation was chiefly white oak, post oak, red oak, and hickory. Dogwood, sourwood, sweetgum, yellow-poplar, and shortleaf pine grow in places. About two-thirds of the acreage is cultivated or pastured. Some formerly cultivated areas now have a cover of shortleaf pine and loblolly pine.

Representative profile of Cecil sandy loam, 2 to 6 percent slopes, eroded, in a pasture:

Ap—0 to 8 inches, brown (7.5YR 5/4) sandy loam; weak, fine, granular structure; very friable; many roots; very strongly acid; abrupt, smooth boundary.

B1t—8 to 11 inches, red (2.5YR 4/8) sandy clay loam; weak to moderate, medium, subangular blocky structure; friable; weak clay bridging; many quartz grains; many roots; very strongly acid; abrupt, smooth boundary.

B21t—11 to 27 inches, red (2.5YR 4/6) clay; moderate to strong, medium, subangular blocky structure; friable; clay films on ped surfaces; many fine roots; very strongly acid; gradual, wavy boundary.

B22t—27 to 34 inches, red (2.5YR 4/6) clay; strong, medium, subangular blocky structure; firm; clay films on ped surfaces; few quartz grains; very strongly acid; gradual, wavy boundary

B3t 34 to 60 inches, red (2.5YR 4/6) clay loam; moderate, medium, subangular blocky structure; friable; clay films on ped surfaces; few quartz grains; few small mica flakes; very strongly acid; gradual, irregular boundary.

C—60 inches +, red (2.5YR 4/6) sandy clay loam; common, medium, distinct mottles of strong brown (7.5YR 5/8) and white (10YR 8/2); structureless; friable; very strongly acid.

In areas where erosion is not severe, the Ap horizon ranges from dark brown and reddish brown to yellowish brown in color and from 4 to 9 inches in thickness. It is sandy loam. In severely eroded areas, the Ap horizon is red or yellowish-red sandy clay loam 2 to 4 inches thick. The B1t horizon is yellowish-red or red sandy clay loam 3 to 8 inches thick. The B2t horizon is red clay, clay loam, or sandy clay. The solum is 42 to 60 inches thick. Mica flakes range from none to common in the B3t horizon and in the C horizon. Tongues of clay commonly extend into the upper part of the C horizon. The A and B horizons are strongly acid to very strongly acid. Bedrock is at a depth of more than 10 feet.

Cecil soils occur in most places with Madison, Pacolet, Appling, Louisburg, and Davidson soils. They contain less mica, especially in the surface layer and the upper part of the B horizon, than Madison soils. They are deeper than Louisburg soils, have more distinct horizons, and are more clayey. They also are deeper than Pacolet soils and have a redder B horizon than Appling soils. Their surface layer is not so brown as that of Davidson soils, and their B horizon is not so red.

Cecil sandy loam, 2 to 6 percent slopes, eroded (CYB2).—This well-drained soil is on uplands. It occurs as large areas throughout the survey area. It has the profile described as representative of the Cecil series. In much of the acreage, so much material has been lost through erosion that the plow layer now extends into a red sandy clay loam layer. Some areas contain a few shallow gullies and patches where a red sandy clay layer is exposed.

Included with this soil in the mapping were areas of Madison and Appling soils and small areas that are only slightly eroded.

This Cecil soil is well suited to cultivation. Most of the acreage is cultivated. The rest is pastured, wooded, or idle. Erosion is a moderate hazard in cultivated areas. (Capability unit IIe–1; woodland suitability group 3o7)

Cecil sandy loam, 6 to 10 percent slopes, eroded (CYC2).—This soil is on long, narrow ridgetops and moderately long hillsides. The areas range from about 5 to more than 25 acres in size. The surface layer is a mixture of part of the original surface layer and the underlying sandy clay loam and is 5 to 7 inches thick. The uppermost 3 to 6 inches of the underlying layer is red sandy clay loam. Below this is red, friable to firm sandy clay or clay to a depth of 60 inches.

Included with this soil in mapping were small areas of a severely eroded soil. In these areas the surface layer is reddish-brown to red sandy clay loam, tilth is poor, and infiltration is slow.

This Cecil soil generally is in good tilth. Runoff is medium. Runoff and the slope make the hazard of further erosion moderate to severe in cultivated areas. This soil, nevertheless, can be cultivated if it is well managed. It is suited to a wide range of crops. About 30 percent of the acreage is cultivated or pastured. The rest is wooded or left idle. (Capability unit IIIe–1; woodland suitability group 3o7)

Cecil sandy loam, 10 to 25 percent slopes (CYE).—This soil is on moderately long side slopes in areas that range from 3 to more than 20 acres in size. The plow layer has not been mixed with the underlying layer, as is common in other Cecil soils in the survey area, and there are no gullies.

Included with this soil in mapping were small areas of an eroded soil and areas of stony or gravelly soils.

This soil has a thick root zone and generally is in good tilth. In cultivated areas, the hazard of erosion is severe. Slopes are strong, and runoff is very rapid. This soil normally is not suited to cultivation, but the lesser slopes occasionally can be cropped if the soil is well managed. The soil is suited to permanent pasture and pine trees. About 90 percent of the acreage is wooded; the rest is pastured, cultivated, or idle. (Capability unit VIe–2; woodland suitability group 3r8)

Cecil sandy loam, 10 to 25 percent slopes, eroded (CYE2).—This soil is on long and short slopes in areas of 3 to 25 acres. The surface layer is brown or yellowish-brown sandy loam 4 to 6 inches thick. It is a mixture of the original surface layer and the underlying sandy clay loam.

Included with this soil in mapping were some severely eroded areas in which a red, clayey layer is exposed, and areas of a soil that has a gravelly or stony surface layer.

The slope and rapid runoff make the hazard of further erosion severe to very severe. This soil is suited to permanent pasture and pine trees. About 85 percent of the acreage is wooded; the rest is pastured, cultivated, or idle. (Capability unit VIe–2; woodland suitability group 3r8)

Cecil sandy clay loam, 2 to 6 percent slopes, severely eroded (CZB3).—This soil occurs as fairly large areas throughout the survey area. It has a redder, more clayey surface layer than is typical for the Cecil soils. This layer is a mixture of the underlying red or yellowish-red sandy clay loam and remnants of the original surface layer and is about 2 to 4 inches thick. There are scattered gullies.

Included with this soil in mapping were areas of Madison and Pacolet soils.

Tilth generally is poor. A clayey layer is near the surface in many areas; thus, infiltration is slow and runoff is rapid. In cultivated areas the hazard of erosion is moderate to severe.

This soil is fairly well suited to cultivated crops (fig. 5), and about a third of the acreage is cultivated. Most of the rest is pastured, wooded, or idle. (Capability unit IIIe–1; woodland suitability group 4c2e)

Cecil sandy clay loam, 6 to 15 percent slopes, severely eroded (CZD3).—This soil is on uplands. Areas range from a few acres to more than 20 acres in size. Except for the surface layer, this soil has a profile similar to that described as representative for the Cecil series. The surface layer is red sandy clay loam 3 to 4 inches thick. It is a mixture of the underlying red or yellowish-red sandy clay loam layer and remnants of the original surface layer. In some places shallow gullies have cut the surface; in others, a red clay layer is exposed.

Included with this soil in mapping were small areas of soils that are less eroded than this soil, areas of soils that have smoother slopes, and small areas of Davidson, Madison, and Pacolet soils.

Tilth is generally poor, and infiltration is moderate to slow. Erosion is a severe hazard in cultivated areas, and only a few cultivated crops can be grown. About 85 percent of the acreage is wooded; the rest is pastured, left idle, or cultivated. (Capability unit VIe–2; woodland suitability group 4c2e)

Figure 5.—Corn and tall fescue in parallel-strip rotation. The soil is Cecil sandy clay loam, 2 to 6 percent slopes, severely eroded.

Chewacla Series

The Chewacla series consists of nearly level, somewhat poorly drained soils that formed in alluvium. These soils generally are on broad flood plains along creeks and streams and are along the outer edges of the flood plains of the Flint River.

In a representative profile, the surface layer is dark reddish-brown silty clay loam about 8 inches thick. Below this is silty clay loam about 40 inches thick. It is dark reddish brown in the upper part and dark brown in the lower part. Depth to hard rock is more than 10 feet in most places.

These soils are low in natural fertility, medium in content of organic matter, and strongly acid to medium acid. Permeability is moderate, and the available water capacity is medium.

About 60 percent of the acreage is pastured or wooded. The rest is cultivated or idle. The chief plants in wooded areas are sweetgum, yellow-poplar, beech, water oak, alder, willow, and other trees that tolerate wetness.

Representative profile of Chewacla silty clay loam, in pasture:

Ap—0 to 8 inches, dark reddish-brown (5YR 3/3) silty clay loam; weak, medium, granular structure; friable; many mica flakes; many small roots; strongly acid; clear, smooth boundary.

B—8 to 14 inches, dark reddish-brown (2.5YR 3/4) silty clay loam; moderate, fine, subangular blocky structure; friable; many mica flakes; many small roots; strongly acid; clear, smooth boundary.

Ab—14 to 26 inches, dark brown (7.5YR 3/2) silty clay loam; common, fine, distinct mottles of very pale brown (10YR 7/4) and light gray (10YR 7/2); moderate, medium, subangular blocky structure; firm; many mica flakes; many small roots; strongly acid, clear, wavy boundary.

Bb—26 to 48 inches +, brown to dark-brown (7.5YR 4/4) silty clay loam; common, medium, distinct mottles of light gray (10YR 7/2); strong, medium, angular blocky structure; firm; many mica flakes; few fine roots; strongly acid.

The Ap horizon is dark reddish-brown and dark-brown to brown silty clay loam, silt loam, or sandy loam 5 to 8 inches thick. The B horizon is dark reddish-brown to brown silty clay loam, silt loam, or fine sandy loam 5 to 16 inches thick. The Ab and Bb horizons are dark brown to light brownish gray mottled with gray, light gray, and very pale brown.

Chewacla soils occur with the Wehadkee and Buncombe soils and with Alluvial land. They are wetter and less sandy throughout than the Buncombe soils. Chewacla soils are better drained and less gray than the Wehadkee soils. They are more uniform in texture, color, and internal drainage than Alluvial land.

Chewacla complex, occasionally flooded (Cco).—These soils are on flood plains. The areas are about 100 to 300 feet wide, are as much as 1,000 feet long, and range from 5 to 50 acres in size. They are flooded occasionally for brief periods each year. Slopes are 0 to about 2 percent.

This complex is made up largely of Chewacla soils, but intermingled with these soils are small areas of Starr and Wehadkee soils. The pattern and proportion of soils are fairly consistent in each area mapped.

Some areas of these soils have recent accumulations of reddish-brown silt loam to light silty clay loam on the surface. In some places stratified sand about 4 to 10 inches thick occurs at various depths.

Tilth is good, but the depth of the root zone is restricted by a moderately shallow water table. Normally, the water table is at a depth of more than 20 inches, though during wet periods it is at or near the surface. Runoff is slow.

These soils are suited to only a few cultivated crops, but they can be farmed intensively if drainage is provided (fig. 6). About 70 percent of the acreage is wooded or pastured, and the rest is cultivated or idle. (Capability unit IIIw 2; woodland suitability group 1w8)

Chewacla and Wehadkee soils, frequently flooded (Cwf).—These soils are on flood plains of the larger streams in the survey area (fig. 7). They are in areas that range from 5 to 100 acres in size and are frequently flooded during each year for long periods. Slopes are 0 to about 2 percent.

These soils occur in irregular patterns. Either or both kinds of soil may occur in each mapped area. Each kind of soil could be mapped separately, but such mapping is not practical because both kinds of soils are used and managed in the same way.

Most areas of these soils have a reddish-brown alluvial layer on the surface. In some places, stratified layers of coarse sand and gravel 2 to 6 inches thick occur at various depths.

These soils are in poor tilth, and depth of root growth is inhibited by the water table. In most places, the water table is at a depth of less than 10 inches. During wet periods the areas are frequently flooded. Runoff is slow to ponded.

These soils are not well suited to cultivated crops and are only fairly well suited to pasture. About 90 percent of the acreage is wooded or pastured; the rest is idle or cultivated. (Capability unit IVw 1; woodland suitability group 1w9)

Davidson Series

The Davidson series consists of deep, well-drained soils that formed in material weathered from biotite gneiss, diorite, and similar rocks. These soils are in the uplands on broad ridgetops and on hillsides. Slopes range from 2 to 25 percent.

In a representative profile, the surface layer is dusky-red loam about 6 inches thick. Below this is dusky-red

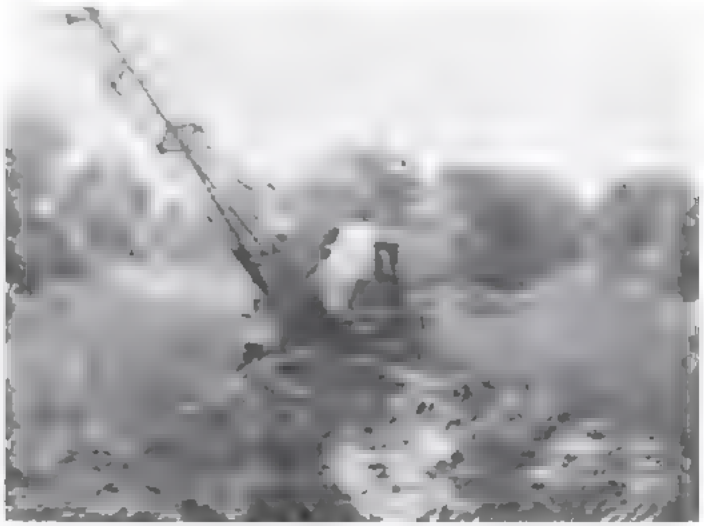


Figure 6.—Dragline digging a channel to allow drainage and improve pasture on Chewacla complex, occasionally flooded.

Figure 7.—**Recently excavated channel along Honey Bee Creek. The soils are Chewacla and Wehadkee soils, frequently flooded.**

clay to a depth of about 49 inches. The next layer is dark-red sandy clay loam about 36 inches thick. Depth to rock fragments is greater than 10 feet.

The natural fertility and content of organic matter are low. These soils are strongly acid to medium acid. Permeability is moderate, and the available water capacity is medium. Tilth is good only within a narrow range of moisture content.

About 55 percent of the acreage is cultivated or pastured. The vegetation in wooded areas is chiefly shortleaf and loblolly pines, white oak, post oak, red oak, hickory, and sassafras.

Representative profile of Davidson loam, 2 to 6 percent slopes, in idle field:

Ap—0 to 6 inches, dusky-red (10R 3/4) loam; weak, fine, granular structure; friable; many fine to medium roots; strongly acid; clear, smooth boundary

B21t—6 to 27 inches, dusky-red (10R 3/4) clay; moderate, medium, subangular blocky structure; firm; clay films on ped surfaces; few fine roots; strongly acid; clear, smooth boundary.

B22t—27 to 49 inches, dusky red (10R 3/4) clay; moderate, medium, angular blocky structure; firm; clay films on ped surfaces; few fine roots; strongly acid; gradual, wavy boundary.

B23t—49 to 85 inches, dark-red (10R 3/6) heavy sandy clay loam; moderate, medium, subangular blocky structure; firm; clay films on ped surfaces; few fine roots; strongly acid; gradual, wavy boundary.

B3t—85 to 100 inches, red (10R 4/6) light sandy clay loam; weak, medium, subangular blocky structure; friable; many fragments of dark-colored weathered rock; strongly acid.

In areas that are slightly eroded or eroded, the Ap horizon is dusky-red or dark reddish-brown loam 5 to 8 inches thick. In severely eroded areas, the Ap horizon is dusky-red or dark reddish-brown clay loam, but it is 2 to 6 inches thick. The B21t and the B22t horizons are dusky-red to dark-red clay. The B23t horizon is dark-red clay to heavy sandy clay loam. In most areas these soils are underlain by streaked reddish and brownish saprolite that extends to a depth of more than 10 feet.

Davidson soils occur mainly with Cecil and Madison soils, but they occur with Pacolet soils in a few small areas. They have a browner Ap horizon than Cecil, Madison, and Pacolet soils and have a darker red B2t horizon

Davidson loam, 2 to 6 percent slopes (DgB).—This soil occupies broad ridgetops in areas of 5 to 25 acres. It has the profile described as representative of the Davidson series.

Included with this soil in mapping were a few eroded spots and small severely eroded areas where the surface layer is clay loam. Also included were a few small areas where the surface layer is sandy loam and fine sandy loam.

This Davidson soil generally is in good tilth and has a deep root zone. It is suited to a wide range of crops, and it can be cultivated somewhat intensively if well managed. About 60 percent of the acreage is cultivated or

pastured. The rest is wooded, idle, or is used as building sites for homes or industries. (Capability unit IIe–1; woodland suitability group 3o7)

Davidson loam, 6 to 10 percent slopes, eroded (DgC2).—This soil is on long hillsides in areas that range from 5 to 20 acres in size. The surface layer is dark reddish-brown to dusky-red loam 5 to 7 inches thick. Below this layer is dark-red clay that extends to a depth of about 52 inches. The next layer is dark-red sandy clay loam about 36 inches thick. In most places a few galled spots and shallow gullies have formed.

Included with this soil in mapping were a few, small, severely eroded areas in which the surface layer is clay loam.

This Davidson soil is suited to farming, but the hazard of erosion is moderate in cultivated areas. This soil is suited to many kinds of crops, and response to management is good. About half the acreage is cultivated or pastured. The rest is wooded, idle, or used as building sites for homes or industries. (Capability unit IIIe–1; woodland suitability group 3o7)

Davidson loam, 10 to 15 percent slopes, eroded (DgD2).—This soil is on long side slopes in areas of 5 to 20 acres. In most of the acreage, the plow layer extends into the underlying dusky-red clay loam. Otherwise the profile of this soil is similar to the one described as representative of the Davidson series. A few shallow gullies and rills have formed in some places.

Included with this soil in mapping were small, severely eroded areas. In these areas the surface layer is clay loam.

This Davidson soil is suited to farming. It responds fairly well to good management, and it is suited to a number of crops. If cultivated crops are grown, however, the hazard of further erosion is severe. Most of the acreage is wooded; the rest is pastured, cultivated, or idle. (Capability unit IVe–1; woodland suitability group 3o7)

Davidson clay loam, 2 to 6 percent slopes, severely eroded (DhB3).—This gently sloping soil is on broad ridgetops in areas of 5 to 50 acres. The surface layer is dark reddish-brown to dusky-red clay loam 4 to 6 inches thick. Below this layer is dusky-red clay and sandy clay loam to a depth of 60 inches or more. The present surface layer consists mainly of clay loam material that has been mixed with remnants of the original surface layer. In most areas small gullies or a few deep gullies have formed. Tilth is poor.

Included with this soil in mapping were areas of Cecil, Madison, and Pacolet soils too small to be mapped separately.

The slopes and slow infiltration make runoff medium to moderately rapid. The hazard of further erosion, therefore, is moderate to severe in cultivated areas. If the soil is well managed, however, it is suited to a fairly wide range of crops. About half of the acreage is cultivated or pastured; the rest is wooded or idle. (Capability unit IIIe–1; woodland suitability group 4c2e)

Davidson clay loam, 6 to 10 percent slopes, severely eroded (DhC3).—This soil is on long hillsides adjacent to narrow ridgetops in areas of 5 to 30 acres. The surface layer is dark reddish-brown to dusky-red clay loam. The surface layer is underlain by dark-red or dusky red clay about 40 inches thick. Below this layer is dark-red sandy clay loam that extends to a depth of about 70 inches. In most areas shallow gullies and a few deep gullies have formed. Tilth is poor.

Included with this soil in mapping were areas of Cecil, Madison, and Pacolet soils. These areas are too small to be mapped separately.

Because this soil is sloping and has slow infiltration, runoff is moderately rapid. The hazard of further erosion is severe in cultivated areas. If well managed, this soil can be cultivated occasionally, but it is only fairly suited to cultivated crops. It is well suited to permanent pasture and to pine trees. About 40 percent of the acreage is cultivated or pastured; the rest is wooded or idle. (Capability unit IVe–1; woodland suitability group 4c2e)

Davidson clay loam, 10 to 25 percent slopes, severely eroded (DhE3).—This soil is in areas that range from 3 to 25 acres in size. The surface layer is dark reddish-brown to dusky-red clay loam 2 to 4 inches thick. This layer is underlain mainly by dusky-red clay, which extends to a depth of about 50 inches. In some places shallow and deep gullies are common, and the underlying dusky-red, clayey layer is exposed.

Included with this soil in mapping were small areas of Cecil, Madison, and Pacolet soils, and of gravelly and stony soils.

This soil is poorly suited to farming. Steep slopes, slow infiltration, and rapid runoff make the erosion hazard very severe unless this soil is protected. Cultivated crops are not suited, and clean-tilled crops, especially, are not suited. Most of the acreage is wooded or idle; the rest is pastured. (Capability unit VIe–2; woodland suitability group 4c2e)

Enon Series

The Enon series consists of well-drained soils that formed in residual material weathered from diorite, gabbro, hornblende gneiss, and hornblende schist. Intrusions of granite and gneiss occur within layers of the material. Enon soils occur on low, narrow ridges. Slopes range from 2 to 25 percent.

In a representative profile, the surface layer is grayish-brown fine sandy loam about 4 inches thick. The next layer is about 44 inches thick. It is brownish-yellow clay loam in the uppermost 6 inches, yellowish-brown clay mottled with strong brown and red in the next 12 inches, and light olive-brown clay loam in the lowermost 26 inches. Below is weathered rock mixed with clay loam.

These soils have low natural fertility and a low content of organic matter. They are slightly acid or medium acid. Permeability is slow, and the available water capacity is medium.

Nearly all the acreage has been cultivated, but most areas are now pastured or in loblolly pine. The native vegetation was chiefly white oak, red oak, post oak, blackjack oak, hickory, dogwood, and shortleaf and loblolly pines.

In Lamar, Pike, and Upson Counties, Enon soils occur closely with the Wilkes soils and are mapped only in undifferentiated groups with those soils. A description of the Wilkes soils is given under the Wilkes series.

Representative profile of Enon fine sandy loam, 2 to 10 percent slopes, under pines and mixed native grasses:

Ap—0 to 4 inches, grayish-brown (10YR 5/2) fine sandy loam; weak, fine, granular structure; very friable; many roots; medium acid; abrupt, smooth boundary.

B21t 4 to 10 inches, brownish-yellow (10YR 6/8) clay loam; weak, medium, subangular blocky structure; friable; many roots; clay films on ped surfaces; common fine mica flakes; medium acid; gradual, wavy boundary.

B22t 10 to 22 inches, yellowish-brown (10YR 5/8) clay; many, medium, distinct mottles of strong brown (7.5YR 5/8) and red (2.5YR 4/8); moderate, coarse, angular blocky structure; firm; few roots; common mica flakes; clay films on ped surfaces; slightly acid; gradual, wavy boundary.

B3t 22 to 48 inches, light olive-brown (2.5Y 5/4) clay loam; weak, medium, subangular blocky structure; firm; common mica flakes; 15 to 20 percent dark-colored weathered rock; slightly acid; abrupt, irregular boundary.

C—48 inches +, dark-colored weathered rock mixed with olive-brown clay loam.

The Ap horizon is dark-brown to grayish brown fine sandy loam, sandy loam, and gravelly sandy loam 4 to 8 inches thick. The B2t horizons are clay loam to clay that is brownish yellow through yellowish brown and light olive brown. The thickness of the solum ranges from 30 to 48 inches.

Enon soils occur mainly with the Helena, Appling, and Wilkes soils. They are better drained than the Helena soils and are less gray in the lower solum. They generally have a thinner solum and are less acid than the Appling soils Enon soils have a thicker solum and are more clayey than the Wilkes soils.

Gullied Land

Gullied land (Gul) consists of an intricate pattern of narrow ridges separated by shallow to deep gullies that have steep side slopes. In some places the areas occupy only a few acres, but in others they are as large as 10 to 20 acres. They are adjacent to areas of Davidson, Madison, Pacolet, Cecil, Mountainburg, Holston, and Wickham soils.

In most places the gullies have cut into the underlying weathered mica, schist, granite, quartzite, or gneiss. On the ridges between the gullies, the soil material generally is sandy clay loam or clay loam. In most places erosion has removed all the original surface layer and subsoil, and plant growth is sparse.

The soil material is strongly acid to very strongly acid. The content of organic matter and the supply of available plant nutrients are very low. Runoff is very rapid.

Gullied land is not suited to cultivation. It is better suited to woodland, particularly pine trees, than to other uses. Good management is needed to establish good stands of pines. (Capability unit VIIe–4; not assigned to a woodland suitability group)

Helena Series

The Helena series consists of very gently sloping, moderately well drained soils. These soils formed in material weathered from granite, granite gneiss, and similar rocks. They are chiefly in the uplands around the heads of drainageways, in slight depressions, and at the base of slopes. Slopes range from 2 to 6 percent.

In a representative profile, the surface layer is light brownish-gray sandy loam about 8 inches thick. Below this is olive-yellow sandy clay loam to a depth of about 13 inches. The next layer is clay and sandy clay about 39 inches thick. It is yellowish brown in the upper part and pinkish gray mottled with brownish yellow and strong brown in the lower part. Depth to hard rock generally is 4 to 6 feet.

Natural fertility and content of organic matter are low. These soils are strongly acid. Permeability is slow, and the available water capacity is medium.

About half the acreage is wooded or pastured; the rest is cultivated or idle. Water oak, yellow-poplar, alder, sweetgum, and blackgum are the chief trees in wooded areas.

Representative profile of Helena sandy loam, 2 to 6 percent slopes, in an idle field:

Ap—0 to 8 inches, light brownish-gray (2.5Y 6/2) sandy loam; weak, medium, granular structure; very friable; many fine to medium roots; strongly acid; clear, smooth boundary.

B1t—8 to 13 inches, olive-yellow (2.5Y 6/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; clay films on ped surfaces; many fine to medium roots; strongly acid; clear, smooth boundary.

B2t—13 to 29 inches, yellowish-brown (10YR 5/8) clay; moderate, coarse, angular blocky structure; firm; clay films on ped surfaces; few fine roots; strongly acid; gradual, wavy boundary.

B3tg—29 to 52 inches, pinkish-gray (7.5YR 7/2) sandy clay; many, coarse, prominent mottles of brownish yellow (10YR 6/8) and strong brown (7.5YR 5/8); moderate, medium, angular blocky structure; firm; clay films on ped surfaces; strongly acid

The Ap horizon is light brownish-gray through dark grayish-brown and grayish-brown sandy loam and fine sandy loam. The B2t horizon is light olive-brown through olive and yellowish-brown sandy clay and clay. The B3tg horizon ranges from pinkish gray to light yellowish brown. In some places the soil lacks a matrix color and is mottled with shades of gray, brown, and olive.

Helena soils occur mainly with the Appling, Louisburg, and Wilkes soils. They have a thicker solum and a more clayey B horizon than the Louisburg and Wilkes soils. Helena soils are not so well drained as the Appling soils.

Helena sandy loam, 2 to 6 percent slopes (HYB).—This is the only Helena soil mapped in the survey area. Individual areas range from about 2 to 10 acres in size. Depth to mottling generally is 25 to 30 inches.

The surface layer of this soil is in good tilth. The root zone is moderately deep. Depth to the seasonal water table ordinarily is more than 20 inches.

Included with this soil in mapping were areas of Appling and Wilkes soils.

This Helena soil is suited to only a few cultivated crops, but the crops grow fairly well if management is good. Most of the acreage has been cultivated, but now about half of it is wooded or pastured. (Capability unit IIe–4; woodland suitability group 3w8)

Holston Series

The Holston series consists of very gently sloping to sloping, well-drained soils. These soils formed in old alluvial or colluvial material that weathered from sandstone and quartzite. They are on uplands. Slopes are 2 to 15 percent.

In a representative profile, the surface layer is yellowish-brown sandy loam about 5 inches thick. Below this is a layer of sandy clay loam about 55 inches thick. It is yellowish brown in the uppermost part, yellowish brown mottled with red in the middle part, and yellowish brown mottled with red and light brownish gray in the lowermost part. Rounded quartzite pebbles are on the surface and throughout the profile in most areas. In most places depth to hard rock is 4 to 6 feet.

These soils have low natural fertility and a low content of organic matter. They are very strongly acid. Permeability is moderate, and the available water capacity is medium. Tilth is generally good.

Although the Holston soils are inextensive in the survey area, they are among the better soils for farming. About 65 percent of the acreage is cultivated or pastured; the rest is wooded or idle. Red oak, white oak, hickory, dogwood, and pines are the chief trees in wooded areas.

Representative profile of Holston sandy loam, 2 to 6 percent slopes, under mixed pines:

Ap—0 to 5 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; very friable; common rounded quartzite pebbles; many roots; very strongly acid; clear, smooth boundary.

B1t—5 to 11 inches, yellowish brown (10YR 5/8) light sandy clay loam; weak, medium, subangular blocky structure; friable; common rounded quartzite pebbles; many roots; very strongly acid; gradual, wavy boundary.

B21t—11 to 21 inches, yellowish-brown (10YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; clay films on ped surfaces; common rounded quartzite pebbles; few fine roots; very strongly acid; gradual, wavy boundary.

B22t—21 to 46 inches, yellowish-brown (10YR 5/8) sandy clay loam; common, medium, distinct mottles of red (2.5YR 4/8); moderate, medium, subangular blocky structure; firm; clay films on ped surfaces; common rounded quartzite pebbles; very strongly acid; gradual, wavy boundary.

B23t—46 to 60 inches +, yellowish-brown (10YR 5/8) sandy clay loam; many, coarse, prominent mottles of red (2.5YR 4/6) and light brownish gray (10YR 6/2); moderate, medium, angular blocky structure; very firm; common rounded quartzite pebbles; very strongly acid.

The Ap horizon ranges from light brownish gray to yellowish brown in color. In most areas this horizon is sandy loam, but in some areas, it is fine sandy loam or gravelly fine sandy loam. The Ap horizon ranges from 3 to 15 inches in thickness. In the Bt horizons, the matrix color ranges from yellowish brown through brownish yellow and strong brown. Clay content of the B22t horizon is 20 to 30 percent. The thickness of the solum is greater than 60 inches.

The Holston soils occur mainly with the Wickham, Pacolet, Molena, and Madison soils. They are sandier throughout than the Pacolet soils and are more yellow than any of the associated soils. The Holston soils are less micaceous than the Madison soils, and they are less sandy than the Molena soils.

Holston sandy loam, 2 to 6 percent slopes (HVB).—This well-drained soil has the profile described as representative of the Holston series.

Included with this soil in mapping were areas of a soil that has a surface layer of gravelly fine sandy loam, areas that have rounded quartzite pebbles on the surface and throughout the profile, and small areas of Pacolet and Wickham soils.

This soil is well suited to cultivation, and more than half the acreage is cultivated. It is also well suited to pasture plants and pine trees. (Capability unit IIe–2; woodland suitability group 3o7)

Holston sandy loam, 6 to 15 percent slopes (HVD).—This soil is on narrow ridgetops and moderately long side slopes, in areas of 5 to 15 acres. It has a profile similar to the one described as representative of the Holston series.

Included with this soil in mapping were areas of a soil that has a surface layer of gravelly fine sandy loam; small eroded spots where the plow layer extends into the layer below, or where erosion has exposed the yellowish-brown sandy clay loam; areas where a few shallow gullies and rills have formed; and areas that have rounded quartzite pebbles on the surface and throughout the profile.

Because of the slope, runoff is rapid if areas are left bare, and the erosion hazard is severe. Crops grow well if fertilizer is added, but clean-tilled crops should not be grown continuously. This soil is well suited to permanent pasture and pine trees. Less than half the acreage is cultivated; the rest is idle, pastured, or seeded to loblolly pine. (Capability unit IVe–1; woodland suitability group 3o7)

Louisburg Series

The Louisburg series consists of well-drained to excessively drained soils. These soils are in the uplands on narrow ridgetops and on hillsides. They formed chiefly in material weathered from granite and gneiss. Slopes range from 6 to 15 percent.

In a representative profile, the surface layer is grayish-brown coarse sandy loam about 6 inches thick. Below this is mainly yellowish-brown sandy loam to a depth of about 18 inches. The next layer is weathered saprolite about 6 inches thick. Depth to hard rock varies but generally is about 24 inches.

These soils have low natural fertility and a low organic-matter content. They are strongly acid to very strongly acid. Permeability is rapid, and the available water capacity is low.

About 75 percent of the acreage is wooded or pasture; the rest is cultivated or idle.

Representative profile of Louisburg stony soils, 6 to 15 percent slopes, in an idle field:

Ap—0 to 6 inches, grayish-brown (10YR 5/2) coarse sandy loam; weak, medium, granular structure; very friable; stones on the surface; many fine and medium roots; few coarse sand grains and quartz fragments; very strongly acid; clear, smooth boundary.

B—6 to 12 inches, yellowish-brown (10YR 5/4) sandy loam; weak, medium, subangular blocky structure; friable; many fine and medium roots; few fine mica flakes; very strongly acid; gradual, wavy boundary.

BC—12 to 18 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; friable; few fine roots; few fine to medium mica flakes; about 50 percent weathered granite fragments; strongly acid.

C—18 to 24 inches, weathered granite saprolite.

R—24 inches +, hard granite bedrock.

In cultivated areas the Ap horizon is grayish brown through olive brown and yellowish brown and 5 to 8 inches thick. In unplowed areas the A1 horizon is very dark gray through dark grayish brown. The A horizon ranges from coarse sandy loam through loamy sand, but the B horizon is mainly yellowish-brown to yellowish-red loamy sand and sandy loam. In most places the Bt horizon is a thin layer of intermittent sandy clay loam about 2 to 4 inches thick. This layer makes up only a small part of the soil profile. The C horizon is friable, weathered, coarse-grained granite and gneiss that ranges from shades of red through browns and grays. Depth to hard rock is 24 to 48 inches, but in most places rock is not continuous horizontally.

Louisburg soils occur mainly with the Cecil, Pacolet, and Appling soils. They are more shallow over bedrock than the associated soils and have a less clayey B horizon than any of those soils.

Louisburg stony soils, 6 to 15 percent slopes (LmD).—This soil is on narrow ridgetops and on hillsides. The areas range from 5 to 20 acres in size. Stones range from few to many. Depth to hard rock ordinarily ranges from 24 to about 48 inches.

Included with this soil in mapping were a few areas where slopes are 2 percent and others as steep as 25 percent; a few small areas of Cecil, Pacolet, and Appling soils; and small areas that have rock at a depth of about 12 to 24 inches.

Poor tilth, stoniness, and low available water capacity are limitations. Most of the acreage is wooded; the rest is pastured, idle, or cultivated. (Capability unit VIIe–2; woodland suitability group 3x3)

Madison Series

In the Madison series are well-drained soils that formed in material weathered from mica schist, muscovite granite, and micaceous granite gneiss. These soils are on uplands on somewhat broad ridgetops and on long hillsides. Slopes range from 2 to 25 percent. The areas generally are not large and are widely distributed throughout the survey area.

In a representative profile, the surface layer is reddish-brown sandy loam about 7 inches thick. The next layer is red clay loam and clay about 34 inches thick. Below this is mainly red, weathered mica schist that extends to a depth of 60 inches or more. The saprolite is several feet thick, and depth to intermittent hard rock ordinarily is more than 5 feet.

These soils have low natural fertility and a low content of organic matter. They are very strongly acid or strongly acid. Permeability is moderate, and the available water capacity is medium. Tilth is generally good in the less eroded areas but is poor in the severely eroded areas.

About 65 percent of the acreage is wooded or pastured, and the rest is cultivated or idle. The chief trees in the wooded areas are mixed pines, white oak, post oak, and red oak, but hickory and dogwood grow in some places.

Representative profile of Madison sandy loam, 2 to 6 percent slopes, eroded, in a pasture:

Ap—0 to 7 inches, reddish-brown (5YR 4/4) sandy loam; weak, fine granular structure; very friable; many fine mica flakes; few fine pebbles; many small roots; very strongly acid; abrupt, smooth boundary.

B1t 7 to 15 inches, red (2.5YR 4/8) clay loam; moderate, medium, subangular blocky structure; friable; slight greasy feeling; clay films on ped surfaces; many mica flakes; few fine pebbles; many small roots; very strongly acid; gradual, wavy boundary.

B21t—15 to 27 inches, red (2.5YR 4/8) clay; moderate, medium, subangular blocky structure; friable; distinct greasy feeling; clay films on ped surfaces; many mica flakes; few small and medium roots; very strongly acid; gradual, wavy boundary.

B22t—27 to 41 inches, red (2.5YR 4/8) clay; moderate, coarse, subangular blocky structure; friable; distinct greasy feeling; clay films on ped surfaces; many mica flakes; few fine roots; very strongly acid; gradual, irregular boundary.

C—41 to 60 inches +, red (2.5YR 4/8) mica schist that is streaked with yellow and gray and weathered; some clayey material; weak, very coarse, angular blocky structure; firm; high mica content; very strongly acid.

Where the Madison soils are not severely eroded, the Ap horizon is sandy loam 6 to 9 inches thick. It is brown through reddish brown and yellowish red. In severely eroded areas, the Ap horizon is yellowish red or reddish brown sandy clay loam 2 to 6 inches thick.

The Bt horizon is friable, red clay or clay loam to a depth of about 24 to more than 50 inches. The lower part has an irregular boundary and overlies saprolite weathered from schist and gneiss. Pockets or tongues of red clayey material extend from the B3 horizon into the C horizon. Weathered schist projects in thin lenses somewhat vertically into the Bt horizon. The Bt horizon contains common to many, fine and medium mica flakes. The C horizon is soft weathered saprolite of schist rock several feet thick. Depth to intermittent hard rock is ordinarily more than 5 feet.

Madison soils occur with the Appling, Cecil, Davidson, Louisburg, and Pacolet soils. Madison soils are more clayey than the Louisburg soils and have more distinct horizons.

Madison sandy loam, 2 to 6 percent slopes, eroded (MgB2).—This soil is on moderately broad ridgetops and on narrow saddles between the ridgetops. The areas range from 5 to 30 acres in size. In many places the profile contains small flat fragments of schist and a few quartz pebbles. There are a few galled spots on the surface, and a few shallow gullies have formed. This soil has the profile described as representative of the series.

Infiltration is moderate, runoff is medium, and the hazard of further erosion is slight to moderate in cultivated areas.

Included with this soil in mapping were a few areas of Cecil, Pacolet, and Appling soils and areas where the surface layer is gravelly sandy loam or fine sandy loam.

This Madison soil is suited to a wide range of crops, and it can be farmed somewhat intensively. Crops grow well if management is good. Most of the acreage has been cultivated, mainly to cotton and corn. About 60 percent of it is now wooded; the rest is cultivated, pastured, or left idle. (Capability unit IIe–1; woodland suitability group 3o7)

Madison sandy loam, 6 to 10 percent slopes, eroded (MgC2).—This gently sloping soil is on long, narrow ridgetops and hillsides. The areas range from 5 to 20 acres in size. The surface layer and upper part of the underlying layer are about 10 to 15 percent schist and quartz pebbles. In some of the most eroded areas, a layer of red clay loam is exposed.

Included with this soil in mapping were a few areas of Cecil, Pacolet, and Appling soils, along with areas of a soil that has a surface layer of gravelly sandy loam or fine sandy loam.

This Madison soil is fairly well suited to cultivation, and a wide range of crops can be grown. In cultivated areas, however, the hazard of further erosion is moderate to severe. About 75 percent of the acreage is wooded or pastured; the rest is cultivated or idle. (Capability unit IIIe–1; woodland suitability group 3o7)

Madison sandy loam, 10 to 15 percent slopes, eroded (MgD2).—This soil is on fairly long side slopes. Areas range from 5 to 20 acres in size. The surface layer is reddish-brown to yellowish-red, friable sandy loam. It consists of remnants of the original surface layer and material from the upper part of the underlying layer. This material has been mixed by plowing. The layer below the surface layer is red clay or clay loam to a depth of about 25 to 40 inches.

Included with this soil in mapping were a few areas where the surface layer is gravelly sandy loam or fine sandy loam.

The slope and slow infiltration make runoff rapid on this Madison soil. The hazard of further erosion, therefore, is severe in cultivated areas. This soil is suited to permanent pasture and to pine trees. Most of the acreage is wooded; the rest is cultivated, pastured, or idle. (Capability unit IVe–1; woodland suitability group 3o7)

Madison sandy loam, 15 to 25 percent slopes (MgE).—This soil is on short slopes. It generally is adjacent to drainageways. Areas range from 5 to 15 acres in size. The surface layer is friable sandy loam about 7 inches thick. Below this is red clay loam and clay to a depth of 30 or 40 inches.

Included with this soil in mapping were eroded areas or galled spots.

The hazard of erosion is severe in cultivated areas. This soil, therefore, is not suited to cultivation. It is suited to pasture grasses and pine trees. Most of the acreage is wooded; the rest is cultivated, pastured, or idle. (Capability unit VIe–2; woodland suitability group 3r8)

Madison sandy clay loam, 2 to 6 percent slopes, severely eroded (MrB3). -This soil is on broad ridgetops and long hillsides. Areas range from about 5 to 20 acres in size. The surface layer is reddish-brown to yellowish red sandy clay loam about 4 to 6 inches thick. Below this is mainly red clay about 20 to 40 inches thick. Shallow gullies have cut through the surface layer into the underlying red clay.

This soil is in poor tilth. Infiltration is slow, and runoff is medium to moderately rapid. The hazard of further erosion is moderate to severe in cultivated areas.

Crops respond fairly well to good management. Most of the acreage has been cropped at some time, chiefly to cotton and corn. About 55 percent is now wooded or pastured; the rest is cultivated or idle, or is used as building sites for homes or industries. (Capability unit IIIe-1; woodland suitability group 4c2e)

Madison sandy clay loam, 6 to 15 percent slopes, severely eroded (MrD3).—This soil is on long, narrow ridgetops and moderately long hillsides. The areas range from 5 to 15 acres in size. The surface layer is reddish-brown to yellowish-red, friable sandy clay loam, 3 to 5 inches thick. It consists of remnants of the original surface layer and material from the upper part of the underlying layer. This material has been mixed by plowing. Below the surface layer is mainly red clay or clay loam about 23 to 35 inches thick. Some small gullies and a few deep ones have formed.

Included with this soil in mapping were a few areas where the surface layer is gravelly sandy clay loam and some areas where it is sandy loam.

Because this soil is sloping and has slow infiltration, runoff is moderately rapid in cultivated areas. The hazard of further erosion is severe. If the soil is well managed, row crops can be grown occasionally, even though tilth is poor. Permanent pasture and pine trees are suited. More than 75 percent of the acreage is in second-growth pines; oaks grow in a few areas. The rest of the acreage is cultivated, pastured, or idle, or used as building sites for homes or industries. (Capability unit VIe–2; woodland suitability group 4c2e)

Molena Series

The Molena series consists of somewhat excessively drained soils on smooth slopes, ridgetops, and long slopes in the uplands. The areas are medium to large in size. Slopes range from 2 to 10 percent.

In a representative profile, the surface layer is reddish-brown loamy sand about 7 inches thick. Below this layer is yellowish-red loamy sand about 44 inches thick. Underlying this is yellowish-red coarse sand to a depth of 60 inches or more. Depth to hard rock ordinarily is more than 15 feet.

These soils have low natural fertility and a low content of organic matter. They are strongly acid to very strongly acid. Permeability is rapid, and the available water capacity is low.

About 60 percent of the acreage is cultivated or pastured. The chief vegetation in wooded areas is water oak, post oak, red oak, white oak, and loblolly and shortleaf pines.

Representative profile of Molena loamy sand, 2 to 10 percent slopes, in a cultivated field:

Ap—0 to 7 inches, reddish-brown (5YR 4/3) loamy sand; structureless; very friable; many fine roots; very strongly acid; abrupt, smooth boundary.

B1—7 to 18 inches, yellowish-red (5YR 4/6) loamy sand; weak, fine, granular structure; very friable; many fine roots; few root channels; few fine mica flakes; very strongly acid; clear, smooth boundary.

B2t—18 to 51 inches, yellowish-red (5YR 5/6) loamy fine sand; moderate, medium, granular structure; very friable; few fine roots; few old root channels; sand grains coated and bridged with clay; few fine mica flakes; very strongly acid, gradual, wavy boundary.

C —51 to 60 inches +, yellowish-red (5YR 5/8) coarse sand; structureless; loose; few fine roots; common fine and medium mica flakes; very strongly acid.

The Ap horizon ranges from reddish brown through dark-brown sand and loamy sand. It is 6 to 12 inches thick. The B2t horizon is yellowish-red to yellowish-brown loamy sand or loamy fine sand. The C horizon is yellowish-red to reddish-yellow sand or coarse sand The solum ranges from 42 to 72 inches in thickness.

The Molena soils occur mainly with the Appling, Pacolet, Wickham, and Holston soils. Molena soils have a high sand content throughout the solum. Their horizons are less distinct than those of the adjoining soils.

Molena loamy sand, 2 to 10 percent slopes (MrC).—This excessively drained soil is the only Molena soil mapped in the survey area. The areas range from 5 to 50 acres in size. The total acreage is small.

Included with this soil in mapping were areas of Pacolet and Wickham soils.

This soil has good tilth and is suited to farming. It is fairly well suited to most crops locally grown. Crops respond well to good management. The hazard of erosion, especially of gullying, is moderate to severe in the steeper, unprotected areas. This soil is suited to permanent pasture and pine trees. (Capability unit IVs–1; woodland suitability group 3s2)

Mountainburg Series

The Mountainburg series consists of well-drained soils that formed in material weathered from sandstone and schist. These soils are on uplands on narrow ridgetops and on hillsides. Slopes range from 15 to 45 percent.

In a representative profile, the surface layer is very dark gray cobbly fine sandy loam about 1 inch thick. The subsurface layer is grayish-brown gravelly fine sandy loam about 3 inches thick. Below this is yellowish-red gravelly sandy clay loam about 10 inches thick. The next layer consists of reddish sandstone fragments, quartz pebbles, and pockets of red sandy clay loam. Ordinarily, horizontally bedded sandstone is at a depth of 20 inches or less.

These soils have low natural fertility and a low organic-matter content. They are very strongly acid. Permeability is rapid, and available water capacity is low.

The vegetation is chiefly mixed hardwoods, such as red oak, elm, hickory, dogwood, and sourwood. Some longleaf and loblolly pines grow in a few areas. About 95 percent of the acreage is wooded; the rest is pastured or idle.

Representative profile of Mountainburg cobbly fine sandy loam, 15 to 45 percent slopes, under a stand of mixed oaks:

A1—0 to 1 inch, very dark gray (10YR 3/1) cobbly fine sandy loam; weak, fine, granular structure; very friable; many rounded quartzite pebbles and cobblestones make up about 60 percent of volume; many fine and medium roots; very strongly acid; clear, smooth boundary.

A2—1 to 4 inches, grayish-brown (10YR 5/2) gravelly fine sandy loam; weak, fine, granular structure; very friable; many rounded quartzite pebbles make up about 30 per cent of volume; few sandstone fragments; many fine and medium roots; very strongly acid; clear, wavy boundary

Bt—4 to 14 inches, yellowish red (5YR 5/8) gravelly sandy clay loam; weak, medium, subangular blocky structure; friable; clay bridging between sand grains; many quartzite pebbles and sandstone fragments make up about 50 percent of volume; many fine to medium roots; very strongly acid, gradual, irregular boundary.

C—14 to 20 inches, reddish sandstone fragments and quartzite pebbles that have pockets of red (2.5YR 4/8) sandy clay loam; many fine roots; very strongly acid; gradual, irregular boundary.

R—20 inches +, hard, reddish and pinkish sandstone, horizontally bedded.

The A1 horizon ranges from very dark gray to dark grayish brown or dark brown, and the A2 horizon from grayish brown to brown or yellowish brown. The A horizon is mainly cobbly fine sandy loam, though some areas are gravelly fine sandy loam. The Bt horizon is yellowish-red, yellowish-brown, or strong-brown gravelly or cobbly sandy clay loam, gravelly loam, or gravelly sandy loam. The content of coarse fragments ranges from 35 to 60 percent. The Bt horizon is 10 to 14 inches thick. The depth to horizontally bedded sandstone ranges from 14 to 20 inches.

Mountainburg soils occur mainly with Pacolet, Madison, Holston, and Wickham soils. They have a thinner solum and contain more coarse fragments than the associated soils.

Mountainburg cobbly fine sandy loam, 15 to 45 percent slopes (MHF).—This is the only Mountainburg soil mapped in the survey area. Areas are on narrow ridgetops and on long and short side slopes.

Included with this soil in mapping were small areas where the surface layer is stony or gravelly sandy loam, small areas of Madison soils, and areas where slopes are 6 to 10 percent.

This soil is not suitable for cultivation, because cobblestones are on the surface, bedrock is at a shallow depth, and the steep slopes make the erosion hazard severe. Nearly all the acreage is wooded. Pasture and pine trees are fairly well suited. (Capability unit VIIe–2; woodland suitability group 4r2)

Pacolet Series

The Pacolet series consists of well-drained soils that formed in material weathered from gneiss, mica schist, sandstone, and granite. These soils are on uplands on broad to narrow ridgetops and on moderately long hillsides. Slopes range from 2 to 15 percent.

In a typical profile, the surface layer is very dark grayish brown gravelly sandy loam about 4 inches thick. The subsurface layer is yellow gravelly sandy loam about 8 inches thick, and the next layer is mostly red clay about 21 inches thick. Underlying this is weathered mica schist and pockets of clay loam. In most places depth to weathered and broken rock fragments is 3 to 5 feet, but hard rock ordinarily is at a depth of more than 6 feet.

These soils have low natural fertility and a low content of organic matter. They are strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is medium.

The chief vegetation consists of white oak, red oak, hickory, and loblolly pine. Dogwood, sourwood, sweetgum, shortleaf pine, and yellow-poplar grow in some areas. About 45 percent of the acreage in the smoother, less sloping areas is cultivated or pastured; the rest is planted to loblolly pine or is unimproved woodland.

Representative profile of Pacolet gravelly sandy loam, 6 to 15 percent slopes, under a stand of hardwoods:

A1—0 to 4 inches, very dark grayish-brown (10YR 3/2) gravelly sandy loam; weak, fine, granular structure; very friable; many quartzite pebbles; many medium and fine roots; very strongly acid; clear, wavy boundary.

A2—4 to 12 inches, yellow (2.5Y 7/6) gravelly sandy loam; moderate, medium, granular structure; very friable; many quartzite pebbles; many medium and fine roots; very strongly acid; gradual, wavy boundary.

B1t—12 to 17 inches, red (2.5YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; clay films on ped surfaces; few fine mica flakes; many quartzite pebbles; many medium and fine roots; very strongly acid; gradual, wavy boundary.

B2t—17 to 33 inches, red (10R 4/8) clay; moderate, medium, subangular blocky structure; friable; few clay films on ped surfaces; few fine mica flakes; few quartzite pebbles; few fine roots; very strongly acid; gradual, irregular boundary.

C&B—33 to 38 inches, partly weathered mica schist; pockets of red (10R 4/8) clay loam; weak, medium, subangular blocky structure; friable; 50 to 60 percent schist fragments; many fine mica flakes; few clay films on ped surfaces; very strongly acid; diffuse, irregular boundary.

C1—38 to 50 inches +, partially weathered platy layers of sandstone with ½ to 1½ inch pockets of red (10R 4/8) clay loam between layers of sandstone; many fine mica flakes; few clay films on ped surfaces; very strongly acid.

In color, the A1 horizon ranges from dark grayish brown through very dark grayish brown and very dark brown. In texture, it is gravelly sandy loam and stony loam. The A2 horizon is yellowish brown to grayish brown gravelly sandy loam and stony loam. The combined thickness of the A horizons ranges from 5 to 14 inches. In some areas the lower part of the B2t horizon is mottled with yellowish brown. The B2t horizon is 16 to 22 inches thick, and it has few to common fine mica flakes. The solum ranges from 21 to 36 inches in thickness.

Pacolet soils occur near Appling, Cecil, Louisburg, Mountainburg, and Madison soils. They have a redder B horizon than do Appling soils. Their surface layer contains less mica than that of Madison soils. They have a thicker, more clayey solum than the Louisburg and Mountainburg soils. They have a thinner solum than the Cecil soils.

Pacolet stony loam, 2 to 6 percent slopes (PkB).—This soil has a profile similar to the one described as representative of the Pacolet series, except that the surface layer is stony loam. This soil is on broad to narrow ridgetops.

Included with this soil in mapping were a few eroded areas where the surface layer is red or yellowish red and some areas where the surface layer is gravelly sandy loam about 8 inches thick.

This Pacolet soil can be cultivated if it is well managed. It is suited to a wide range of crops. Stones on the surface and in the soil interfere with tillage in some areas. In areas that are cultivated or left bare, the hazard of further erosion is moderate. About 50 percent of the acreage is cultivated or pastured; the rest is wooded or left idle. (Capability unit IIIe–1; woodland suitability group 3x3)

Pacolet stony loam, 6 to 10 percent slopes (PkC).—This soil has a profile similar to that described as representative of the Pacolet series, except that it is stony, has a loamy surface layer, and is 4 to 6 inches thinner. This soil generally is on moderately long hillsides and is adjacent to ridgetops.

Included with this soil in mapping were a few areas that have a surface layer of gravelly sandy loam and some severely eroded areas where tilth is poor and the surface layer is red or yellowish-red sandy loam.

If well managed, this soil can be cultivated. It is suited to a wide range of crops. Stones and gravel on the surface interfere with tillage in some fields. Erosion is a moderate hazard in cultivated areas unless the soil is protected. About 60 percent of the acreage is wooded or idle; the rest is cultivated or pastured. (Capability unit IVe–1; woodland suitability group 3x3)

Pacolet gravelly sandy loam, 2 to 6 percent slopes (PmB).—This soil is on narrow to broad ridgetops. Its surface layer is dark grayish-brown gravelly sandy loam 2 to 6 inches thick. Otherwise, its profile is similar to the one described as representative of the Pacolet series.

Included with this soil in mapping were a few, small, eroded areas where the surface layer is yellowish-red sandy clay loam.

This soil is suited to cultivation, but the hazard of erosion is moderate if it is cultivated and not protected. Crops grow well in most areas if management is good, and response of crops is fair to good. This soil is well suited to use as sites for homes and industries. About 45 percent of the acreage is cultivated or pastured; the rest is wooded or idle. (Capability unit IIe–1; woodland suitability group 3o7)

Pacolet gravelly sandy loam, 6 to 15 percent slopes (PmD).—This soil has the profile described as representative of the Pacolet series. It is on broad ridgetops and moderately long hillsides. Areas range from 5 to 30 acres in size.

Included with this soil in mapping were a few eroded areas where a red clayey layer is exposed and areas where the surface layer is yellowish-brown to strong-brown sandy loam.

In cultivated areas that are not protected, the hazard of erosion is severe because of slope, texture, and rapid runoff. If this soil is well managed, however, it can be cultivated occasionally. It is suited to permanent pasture and pine trees. About 75 percent of the acreage is wooded; the rest is cultivated, pastured, or idle. (Capability unit IVe–1; woodland suitability group 3o7)

Rock Land

Rock land (Roc) consists mainly of small areas that have granite at the surface or within a depth of a few inches. In some places boulders rest on the bedrock. Slopes are mainly 2 to about 6 percent.

In most places Rock land is associated with Louisburg, Cecil, Pacolet, and Wilkes soils.

Only a few plants grow on Rock land. Lichens, mosses, and cactus grow on rock faces and in thin patches of soil material. A few small trees, shrubs, and bushes grow in crevices where the loose material is thickest.

Rock land can be developed for recreational uses in some areas. It furnishes little food and cover for wildlife habitat. (Capability unit VIIIs–1; not assigned to a woodland suitability group)

Starr Series

The Starr series consists of well-drained soils that formed in old alluvium. These soils are in slight depressions, around drain heads, on foot slopes, and on alluvial plains. Slopes are 0 to about 2 percent.

In a representative profile, the surface layer is dark reddish-brown sandy loam about 8 inches thick. Below this is a layer of mainly clay loam about 44 inches thick. It is reddish brown in the uppermost part, yellowish red in the middle part, and red in the lowermost part. The next layer is strong-brown sandy clay loam mottled with yellowish red and red. It is about 8 inches thick. Depth to bedrock is more than 10 feet.

These soils are medium in natural fertility and content of organic matter and are strongly acid. Permeability is moderately rapid, and the available water capacity is medium. Depth to the seasonal high water table is greater than 5 feet.

The vegetation is chiefly sweetgum, elm, water oak, beech, yellow-poplar, and loblolly pine. Nearly all of the acreage is cultivated or pastured; the rest is wooded or idle.

Representative profile of a Starr sandy loam in a cultivated field:

Ap—0 to 8 inches, dark reddish-brown (5YR 3/4) sandy loam; weak, fine, granular structure; very friable; many small roots and few mica flakes; strongly acid; clear, smooth boundary.

B21—8 to 24 inches, reddish-brown (5YR 4/4) light clay loam; weak, medium, subangular blocky structure; friable; many fine roots; few fine mica flakes; strongly acid; gradual, wavy boundary.

B22—24 to 40 inches, yellowish-red (5YR 4/8) clay loam; weak, medium, subangular blocky structure; friable; few fine mica flakes; strongly acid; gradual, wavy boundary.

B23—40 to 52 inches, red (2.5YR 5/8) clay loam; weak, medium, subangular blocky structure; friable; few fine mica flakes; strongly acid; gradual, wavy boundary

C—52 to 60 inches, strong-brown (7.5YR 5/6) sandy clay loam; few, fine, distinct, yellowish-red (5YR 4/8) and red (2.5YR 4/8) mottles; structureless; friable; strongly acid.

The A horizon ranges from brown through dark brown and dark reddish brown. It is sandy loam, loam, or sandy clay loam and is 6 to 9 inches thick. The B horizon is yellowish-red, strong-brown, red, or dark red loam, sandy clay loam, or clay loam. The solum is 40 to 60 inches thick. In some areas a buried Bt horizon occurs below a depth of 40 inches.

Starr soils occur mainly with Davidson, Cecil, Chewacla, and Wehadkee soils. They are less clayey in the B horizon than Cecil and Davidson soils and are better drained than Chewacla and Wehadkee soils.

Starr soils (Sto).—This is the only mapping unit of Starr soils in the survey area. The surface layer is sandy loam, loam, or sandy clay loam. These soils are in areas about 2 to 5 acres in size. Slopes are 0 to about 2 percent.

These soils are well suited to a wide range of locally grown crops and pasture grasses. They can be farmed intensively, and crops respond well to management. Most of the acreage has been cropped, mainly to cotton, corn, and vegetables. In naturally wooded areas, the trees are chiefly water oak, elm, beech, yellow-poplar, and sweetgum. Loblolly and shortleaf pines have been planted in some areas. (Capability unit I–1; woodland suitability group 1o7)

Wehadkee Series

In the Wehadkee series are poorly drained soils on first bottoms. These soils formed in alluvium washed from areas underlain primarily by granite, gneiss, and other siliceous igneous and metamorphic rocks. Wehadkee soils are on broad long flood plains along the rivers and other large streams. Slopes are 0 to about 2 percent.

In a representative profile, the surface layer is grayish-brown silty clay loam about 4 inches thick. Below this is about 9 inches of grayish-brown silty clay loam mottled with strong brown and yellowish red. The next layer is gray loam and sandy clay loam mottled with yellowish red and strong brown. Depth to hard rock is more than 10 feet in most places.

These soils have low natural fertility and a low content of organic matter. They are medium acid to very strongly acid. Permeability is moderate, and the available water capacity is medium to high. The water table is near the surface during winter and spring.

About 95 percent of the acreage is wooded or pastured; the rest is cultivated or idle. The chief plants in the wooded areas are willow, blackgum, alder, and other plants that tolerate wetness.

Representative profile of a Wehadkee silty clay loam, under a stand of hardwoods:

O1—1 to ½ inch, fresh hardwood litter of leaves and twigs.
O2—½ inch to 0, very dark grayish brown (10YR 3/2) decomposing forest litter mixed with some mineral matter.
Ag—0 to 4 inches, grayish-brown (10YR 5/2) silty clay loam; few, fine, prominent mottles of yellowish red (5YR 5/6); weak, fine, subangular blocky structure; friable; many fine and medium roots; very strongly acid; clear, smooth boundary.
Bg—4 to 13 inches, grayish-brown (2.5Y 5/2) silty clay loam; many, coarse, prominent mottles of strong brown (7.5YR 5/8) and yellowish red (5YR 4/8); weak, medium, subangular blocky structure; firm; many fine mica flakes; many fine and medium roots; strongly acid; clear, smooth boundary.
IIB21g—13 to 18 inches, gray (5Y 5/1) loam; many, medium, prominent mottles of yellowish red (5YR 4/8) and strong brown (7.5YR 5/8); weak, medium, subangular blocky structure; few fine mica flakes; many fine roots; strongly acid; gradual, wavy boundary.
IIIB22g—18 to 52 inches, gray (N 5/0) sandy clay loam that has pockets of sand; weak, medium, subangular blocky structure; firm; medium acid.

The Ag horizon ranges from very dark grayish brown through grayish brown and gray in color, and through sandy loam, loam, sandy clay loam, and silty clay loam in texture. The Bg horizon is predominantly grayish brown, but ranges through light gray and dark gray. Mottles of yellowish red and strong brown occur at a depth of 4 to 18 inches. The Bg horizon ranges from loam to silty clay loam in texture. Thin lenses of sandy material are in the lower horizons. Reaction throughout is very strongly acid or strongly acid to medium acid.

Wehadkee soils occur with the Buncombe and Chewacla soils and Alluvial land. Wehadkee soils are more clayey and wetter than Buncombe soils. They are grayer and moister than Chewacla soils and Alluvial land.

Wehadkee silty clay loam, frequently flooded (Weh).—This soil has the profile described as representative of the Wehadkee series. Slopes are 0 to about 2 percent. This soil is flooded frequently and is wet for long periods. Tilth is poor. Runoff is very slow. The water table is less than 15 inches below the surface for long periods.

Included with this soil in mapping were small areas of Chewacla soils and areas that contain overwash from some of the red soils on uplands.

This soil is suited to only a limited number of crops. Drainage is needed in cultivated areas. After drainage has been provided, crops respond fairly well if other management is good, but pasture plants are better adapted than row crops. Hardwoods are on most of the acreage. Most areas provide good habitat for waterfowl. (Capability unit IVw–1; woodland suitability group 1w9)

Wehadkee soils, frequently flooded (Wed).—The surface layer of these soils ranges in texture from sandy loam, loam, and silt loam to sandy clay loam. Slopes are 0 to 2 percent. Tilth is poor. Runoff is very slow. Depth to the water table generally is less than 24 inches. In winter, water stays on the surface for periods of more than 10 days.

Included in mapping were areas of Chewacla and Buncombe soils.

Wehadkee soils, frequently flooded, are suited to only a few crops, but they can be cropped intensively if well drained and protected from flooding. Crops grow fairly well, but trees and pasture grasses are better suited than row crops. Except for a few, small, pastured areas, all of the acreage is wooded; the rest is idle. Some areas provide good habitat for waterfowl. (Capability unit IVw–1; woodland suitability group 1w9)

Wickham Series

The Wickham series consists of well-drained soils that formed in material weathered from soils in the higher uplands. These soils are on broad ridgetops and moderately long side slopes. The areas are small and are chiefly near the larger streams. Slopes range from 2 to 10 percent.

In a representative profile, the surface layer is dark grayish-brown gravelly sandy loam about 2 inches thick. The subsurface layer is light yellowish-brown gravelly sandy loam about 10 inches thick. The next layer is yellowish-red sandy clay loam in the uppermost 10 inches, red clay loam in the next 8 inches, and red sandy clay loam mottled with shades of yellow and brown in the lowermost 20 inches. Depth to hard rock is more than 10 feet.

Wickham soils have low natural fertility and a low content of organic matter. They are strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is medium.

About 60 to 70 percent of the acreage is pastured or cultivated. White oak, post oak, and hickory are the main trees in wooded areas. Shortleaf and loblolly pines grow in abandoned fields.

Representative profile of Wickham gravelly sandy loam, 2 to 6 percent slopes, under a mixed stand of oaks:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) gravelly sandy loam; weak, fine, granular structure; very friable; 15 to 20 percent small and medium, rounded quartzite pebbles; many fine and medium roots; very strongly acid; clear, smooth boundary.

A2—2 to 12 inches, light yellowish-brown (10YR 6/4) gravelly sandy loam; moderate, medium, granular structure; very friable; many, small and medium, rounded quartzite pebbles; many fine and medium roots; very strongly acid; clear, smooth boundary.

B21t—12 to 22 inches, yellowish-red (5YR 4/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; many clay films on ped surfaces; few, small and medium, rounded quartzite pebbles; many fine and medium roots; strongly acid; clear, smooth boundary.

B22t—22 to 30 inches, red (2.5YR 4/6) clay loam; moderate, medium, subangular blocky structure; friable; many clay films on ped surfaces; few, small and medium, rounded quartzite pebbles; few fine roots; strongly acid; gradual, wavy boundary.

B3t 30 to 50 inches, red (10R 4/8) sandy clay loam; few, medium, prominent streaks and mottles of brownish yellow (10YR 6/8) and yellowish brown (10YR 5/8); strong, medium, subangular blocky structure; friable; few clay films on ped surfaces; few, small and medium, rounded quartzite pebbles; few fine roots; strongly acid.

The A1 horizon ranges from dark grayish-brown to brown gravelly sandy loam to sandy loam. The A2 horizon is the same texture as the A1 horizon, but it ranges in color from light yellowish brown through olive brown and grayish brown. The A horizons combined are 4 to 12 inches thick. The B22t horizon ranges from yellowish red through red and strong brown in color and from clay loam to sandy clay loam in texture. In most places the B3t horizon has few to common mottles of yellowish brown, brownish yellow, and brown. The solum is about 50 to 72 inches thick.

Wickham soils occur mainly with Holston and Pacolet soils. They have a redder B horizon than the Holston soils. They are less clayey in the B2t horizons than Pacolet soils, and they are deeper.

Wickham gravelly sandy loam, 2 to 6 percent slopes (WsB).—This soil is on broad ridgetops and hillsides in areas that range from 2 to 10 acres in size. It has the profile described as representative of the Wickham series.

Included with this soil in mapping were small, severely eroded areas and a few small areas that have a dark-red layer below the surface layer.

This Wickham soil is well suited to farming. If well managed, it can be farmed intensively. The hazard of erosion is slight to moderate in cultivated areas. About 60 percent of the acreage is cultivated or pastured; the rest is wooded or idle. (Capability unit IIe–1; woodland suitability group 3o7)

Wickham gravelly sandy loam, 6 to 10 percent slopes (WsC).—This soil is on narrow ridgetops and side slopes in areas of 3 to about 10 acres. The surface layer is dark grayish-brown gravelly sandy loam 4 to 12 inches thick. Below the surface layer is mainly yellowish-red and red sandy clay loam and clay loam.

Included with this soil in mapping were small eroded areas that have a layer of yellowish-red sandy clay loam at the surface. In some areas the red sandy clay loam subsoil is mottled with brownish yellow and yellowish brown.

This Wickham soil is well suited to moderately intensive farming. The hazard of erosion is moderate in cultivated and unprotected areas. Small rills and shallow gullies form after a heavy rainfall. About 70 percent of the acreage is cultivated or pastured; the rest is wooded or idle. (Capability unit IIIe–1; woodland suitability group 3o7)

Wilkes Series

The Wilkes series consists of well-drained soils that formed in material weathered in place from a mixture of hornblende gneiss, granite, schist, and other rocks. These soils are in the uplands on narrow ridgetops and short side slopes. Slopes range from 2 to 25 percent.

In a representative profile, the surface layer is very dark grayish-brown fine sandy loam about 2 inches thick. Below the surface layer is about 16 inches of dark-brown and dark yellowish-brown sandy clay loam. The underlying material is dark-brown, green and gray, soft, weathered rock. Stones are on the surface and throughout the profile in many places. Depth to the partly weathered rock is about 18 inches.

These soils have low natural fertility and low content of organic matter. They are slightly acid to strongly acid. Permeability is moderately slow, and the available water capacity is low.

The vegetation is chiefly white oak, post oak, hickory, and sassafras. Shortleaf and loblolly pines grow in some abandoned fields.

The Wilkes soils in Lamar, Pike, and Upson Counties occur closely with the Enon soils and are mapped only as undifferentiated groups with those soils. A complete description of the Enon soils is given under the heading "Enon Series."

Representative profile of Wilkes fine sandy loam, 2 to 10 percent slopes, under second-growth pines and native grasses:

A1—0 to 2 inches, very dark grayish-brown (2.5Y 3/2) fine sandy loam; weak, fine, granular structure; very friable; many fine and medium roots; strongly acid; abrupt, smooth boundary.

B1t—2 to 10 inches, dark brown (10YR 4/3) sandy clay loam; weak, fine, subangular blocky structure; friable; many fine and medium roots; few clay films on ped surfaces; strongly acid; gradual, wavy boundary.

B2t—10 to 18 inches, dark yellowish-brown (10YR 4/4) sandy clay loam; weak, medium, subangular blocky structure; friable; many fine and medium roots; few clay films on ped surfaces; slightly acid; diffuse, irregular boundary.

C—18 to 36 inches +, dark-brown, green and gray, soft, weathered, mixed basic and acidic rock.

The A horizon is sandy loam or fine sandy loam 2 to 6 inches thick. It is very dark grayish brown to dark yellowish brown. The B2t horizon ranges from dark yellowish brown through yellowish brown and light olive brown. It is sandy clay loam or clay loam to silty clay loam. The A and B horizons combined are 10 to 20 inches thick. The underlying rock is mainly weathered schist. In some areas coarse rock fragments occur in the profile.

Wilkes soils occur mainly with the Enon, Helena, and Louisburg soils. They are not so clayey in the B horizon as the Helena and Enon soils. Wilkes soils contain more clay throughout the profile than the Louisburg soils and have a darker brown surface layer.

Wilkes and Enon soils, 2 to 10 percent slopes (WEC).—These gently sloping soils are on narrow ridgetops and moderately long hillsides. The total acreage is inextensive. Most areas range from 5 to 20 acres in size.

Each kind of soil has a profile similar to that described as representative for its series, except that the surface layer varies. In most areas it is fine sandy loam, sandy loam, or gravelly sandy loam.

These soils occur in an irregular pattern. Either or both kinds of soil may occur in a mapped area. In most places these soils are slightly acid, but in a few areas they are strongly acid.

Included with these soils in mapping were soils that have a clayey layer below the surface layer. This layer is about 48 inches thick. In some places the included soils are high in mica content. Weatherable crystalline minerals, such as feldspars, are abundant.

Only a small acreage is cultivated; most of the acreage is wooded. (Capability unit IVe–4; woodland suitability group 4o1)

Wilkes and Enon soils, 10 to 25 percent slopes (WEE).—These soils are on medium to long hillsides. The size of the areas mapped ranges from 5 to 20 acres. Each kind of soil has a profile similar to that described as typical of its respective series, except that the surface layer varies. It is mostly fine sandy loam, sandy loam, or gravelly sandy loam.

These soils occur in an irregular pattern. Both kinds of soils occur in some areas, and only one soil in others.

Included in mapping are small eroded areas and areas that have stones and partly weathered rock at the surface.

Runoff is rapid on bare areas, and the hazard of erosion is severe. Nearly all the acreage is wooded. (Capability unit VIIe–2; woodland suitability group 4r2)

Use of the Soils for Cultivated Crops and Pasture[2]

This section explains the system of capability grouping used by the Soil Conservation Service, describes the soils in each capability unit, and suggests management suited to the soils in each unit. This section also gives estimated acre yields of the main crops and pasture plants for all soils in the survey area and describes the management needed to obtain such yields.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or engineering.

In the capability system, all kinds of soil are grouped at three levels, the capability class, the subclass, and the unit. These are discussed in the following paragraphs.

[2] J. N. Nash, conservation agronomist, Soil Conservation Service, assisted with this section.

Capability Classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

- Class I soils have few limitations that restrict their use.
- Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
- Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.
- Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
- Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife habitat. (None in the survey area.)
- Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat.
- Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife habitat.
- Class VIII soils and landforms have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife habitat, water supply, or esthetic purposes.

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States but not in the survey area, shows that the chief limitation is climate that is too cold or to dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use mainly to pasture, range, woodland, wildlife habitat, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–4 or IIIe–1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the fore-

going paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

In the following pages the capability units in Lamar, Pike, and Upson Counties are described and suggestions for the use and management of the soils are given. The numbers of the units are not in numerical order, because a statewide system is used to number the units in Georgia and not all of the units are in this survey area.

Management by capability units

The soils in Lamar, Pike, and Upson Counties have been grouped in 17 capability units. The soils in each unit have about the same limitations and susceptibility to damage, need about the same management, and respond to management in about the same way.

The main practices needed are those that control erosion, provide drainage, add organic matter to the soil, and increase fertility. The intensity of the practices used for controlling erosion depends mainly on (1) steepness and length of slope, (2) frequency and intensity of rainfall, and (3) use of the soils, that is, whether they are used for cultivated crops or pasture. The only practices needed on the more gently sloping soils, such as Altavista sandy loam, 2 to 6 percent slopes, are contour cultivation and a cropping system that leaves medium to large amounts of residue. On the steeper soils or soils on long slopes, such as Davidson clay loam, 6 to 10 percent slopes, severely eroded, erosion is best controlled by using a practice such as contour farming with or without terraces. Also suitable is stripcropping in a rotation that includes close-growing annuals or perennials or crops that produce much residue.

The kind of drainage needed on wet soils, such as Chewacla complex, occasionally flooded, depends on the amount of excess water in the soil and the kind of crop grown. After the water is controlled, only management that maintains good tilth and good crop growth is needed. Organic matter can be added by planting crops that leave much residue and by returning the residue to the soil. Crop sequences that include perennial grasses or legumes are most beneficial because they provide heavier, more durable residue.

Regular applications of lime and fertilizer are needed to maintain fertility and to increase growth of plants. Lime and fertilizer should be applied in amounts indicated by soil tests and by the kinds of soil and the needs of crops.

Several management practices need to be combined for maintaining good tilth and crop growth and for controlling erosion. Among these are (1) regular applications of lime and fertilizer; (2) good management of crop residue; (3) use of a suitable cropping system; (4) minimum tillage; and (5) use of contour farming, terraces, or both.

Other practices that are helpful are (1) using grassed waterways and outlets for disposal of water from straight rows, from fields farmed on the contour, from terraces, or from stripcropped fields; (2) planting perennial grasses in field borders so as to control erosion at the edge of the field and reduce weed growth; and (3) locating farm roads and fences on the divides of watersheds or on the contour. The location of the roads and fences should permit crop row arrangements that favor efficient farm operations. The fences may be located in or adjacent to natural waterways.

Each capability unit in the three counties is described in the following pages, and management suitable for the soils in each unit is suggested. The soil series represented in each capability unit are named in the description of the unit, but this does not mean that all the soils of a given series appear in the unit. To find the names of the soils in any given capability unit, refer to the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT I–1

Starr soils is the only mapping unit in this capability unit. These soils are in upland depressions and in old alluvial sediment along drainageways. Slopes are 0 to 2 percent. The uppermost 6 or 8 inches is mainly very friable fine sandy loam, sandy loam, or loam. Below the surface layer, to a depth of about 44 inches, is very friable or friable clay loam. Depth to hard rock generally is more than 10 feet.

The soils are strongly acid. The natural fertility and the content of organic matter are medium. Tilth is good, and plant roots can penetrate effectively to a depth of more than 36 inches. Permeability is moderately rapid, and the available water capacity is medium.

These soils are suited to all crops grown locally, including grasses and legumes, and nearly all the acreage is cultivated or pastured. Some areas are wooded or idle. Crops are easy to establish and maintain. Any suitable crop can be grown continuously if good tilth is maintained by returning enough crop residue to the soil. A planned sequence of crops helps in controlling weeds, insects, and disease and in using fertilizer more efficiently.

CAPABILITY UNIT IIe–1

This unit consists of well-drained, very gently sloping soils on uplands. These are soils of the Cecil, Davidson, Madison, Pacolet, and Wickham series. They are slightly to moderately eroded. Slopes range from 2 to 6 percent. These soils have a surface layer of friable loam, sandy loam, or gravelly sandy loam about 4 to 8 inches thick. Below this is clay, clay loam, or sandy clay loam. This layer extends to a depth of about 33 to 60 inches or more. Depth to hard rock generally is more than 6 feet, though rock fragments and weathered rock are at a depth of about 33 inches in some areas.

The soils in this unit are very strongly acid to medium acid. The supply of plant nutrients and the content of organic matter are low. Tilth generally is good, and plant roots can penetrate effectively to a depth of about 36 inches or more. Permeability is moderate, and the available water capacity is medium.

These soils are suited to all crops grown locally, such as cotton, corn, small grains, soybeans, and grain sorghum. They are also suited to grasses and legumes. Crops are easy to establish and to maintain, and they respond well if management is good. Clean-cultivated crops should not be grown continuously, because the hazard of further erosion is slight to moderate.

Generally, the farmer has a choice of cultivating on the contour with or without terraces, or in strips, depending on the kinds of crops to be grown.

The soils should be managed in a way that holds soil losses from erosion within allowable limits. The minimum

cropping system needed depends on the steepness and length of slope and the erosion control practices used. An example of a suitable cropping system on a terraced slope of 2½ percent is 1 year of cotton or a similar crop followed by 1 year of corn or a similar crop. All crop residue and aftermath should be shredded and left on the surface between crops.

CAPABILITY UNIT IIe–2

In this unit are deep, well drained and moderately well drained soils in the Altavista, Appling, and Holston series. These soils occur on uplands and stream terraces. Slopes are 2 to 6 percent. These slightly eroded soils have a surface layer of friable sandy loam about 5 to 8 inches thick. Below the surface layer, to a depth of about 50 inches, is friable sandy clay loam or firm clay. Hard rock generally is at a depth of 4 to 6 feet.

The soils in this unit are strongly acid or very strongly acid. The natural fertility and content of organic matter are low. Tilth is good, and plant roots penetrate to a depth of 36 inches or more. Permeability is moderate, and the available water capacity is medium. These soils warm up more slowly in spring than the soils in capability unit IIe–1.

These soils are well suited to most of the crops grown locally, including grasses and legumes, but are not so well suited to wheat, alfalfa, and barley as the soils in capability unit IIe–1. Crops are easily established and maintained, and they respond well to good management. Clean-cultivated crops should not be grown continuously, because the hazard of erosion is slight to moderate. Sprinkler irrigation is fairly well suited.

Generally, the farmer has a choice of cultivating in straight rows, on the contour with or without terraces, or in strips, depending on the kinds of crops to be grown.

The soils should be managed in a way that holds losses from erosion within allowable limits. The steepness and length of slope and the practices used to control erosion govern the minimum cropping system needed. An example of a suitable cropping system on a 3 percent slope that is 400 feet long is cotton or a similar row crop followed by a small grain. The straw and stubble from the grain crop should be left undisturbed. Crops should be planted in alternate parallel strips on the contour and rotated each year.

CAPABILITY UNIT IIe–4

The one soil in this unit, Helena sandy loam, 2 to 6 percent slopes, is moderately well drained. Its surface layer is about 8 inches thick. Below this and to a depth of about 52 inches is mainly clay and sandy clay. Depth to hard rock commonly is about 4 to 6 feet.

This soil is strongly acid. The natural fertility and the content of organic matter are low. Tilth ordinarily is good. Permeability is slow, and the available water capacity is medium.

Only a few of the crops grown locally are suited, but these crops respond fairly well if well managed. Alfalfa, wheat, and barley are not suited.

Generally the farmer has a choice of cultivating in strips or on the contour with or without terraces, depending on the extent of the limitations and the kinds of crops to be grown.

This soil should be managed in a way that holds soil losses from erosion within allowable limits. The minimum cropping system needed is affected by steepness and length of slope and by the erosion control practices used. An example of a suitable cropping system, on a terraced slope of 3 percent, is 1 year of corn, grain sorghum, or a similar row crop followed by 1 year of a small grain or lespedeza.

CAPABILITY UNIT IIw–2

Alluvial land is the only mapping unit in this capability unit. This land occurs on flood plains and is nearly level and well drained to moderately well drained. The surface layer varies greatly in texture. It commonly is loam and clay loam, but in places it is sandy loam and sandy clay loam. Below the surface layer are thin layers, or strata, of silt loam and sand. In most places depth to hard rock is more than 8 feet.

Alluvial land is strongly acid and is moderate to low in natural fertility and content of organic matter. Tilth is good, and plant roots can penetrate effectively to a depth of about 36 inches or more. Runoff is slow.

Crops on these soils respond well if management is good. Excess water is the main concern. Some drainage may be needed for optimum crop growth. Water management depends on the kind of crop to be grown. If drainage is needed, a system of main and lateral ditches can be designed and installed. Either open ditches or covered tile drains can be used.

After the soil is adequately drained, any suitable crop can be grown continuously if enough plant residue is returned to the soil to maintain good tilth. A planned sequence of crops helps to control weeds, insects, and disease and to use fertilizer more efficiently.

CAPABILITY UNIT IIIe–1

In this unit are well-drained soils that are chiefly eroded or severely eroded. These soils are in the Cecil, Davidson, Madison, Pacolet, and Wickham series. Slopes are 2 to 10 percent. In the less eroded areas, the surface layer is friable sandy loam, gravelly sandy loam, or loam. In the more severely eroded areas, it is friable sandy clay loam or clay loam. Below the surface layer to a depth of about 30 to 60 inches is sandy clay loam to clay. Depth to hard rock commonly ranges from 6 to more than 10 feet.

These soils are low in natural fertility, contain little organic matter, and are medium acid to very strongly acid. Plant roots can penetrate effectively to a depth of about 30 inches or more. Water moves through these soils at a moderate rate, and the available water capacity is medium.

The surface layer of the less eroded soils generally has good tilth, but in severely eroded areas, it consists chiefly of material from below the original surface layer. Tilth is poor. If cultivated in eroded areas, the soils form clods unless the moisture content is optimum. They are suited to many locally grown crops, such as cotton, corn (fig. 8), small grains, grasses, and legumes.

Generally, the farmer has a choice of cultivating on the contour with or without terraces, or in strips. The choice of practice depends on the extent of the soil limitations and the kinds of crops to be grown.

Practices that hold soil losses from erosion within allowable limits are needed. The steepness and length of

Figure 8.—Alternate strips of corn for silage and Coastal bermudagrass for hay. The soils in capability classes IIe–1 and IIIe–1 are in the foreground; those in capability class VIIe–2 are in the background.

slope and the erosion control practices used govern the minimum cropping system required. An example of a suitable cropping system on a terraced slope of 6 percent is 1 year of cotton or a similar row crop followed by 2 years of small grains and lespedeza.

CAPABILITY UNIT IIIe–2

In this unit are slightly eroded and severely eroded soils that are well drained. These soils are in the Appling series. The surface layer ranges from 4 to 8 inches in thickness and is sandy loam to sandy clay loam. Below the surface layer is firm clay that extends to a depth of about 50 inches.

These soils are mostly strongly acid and are low in organic-matter content and natural fertility. Permeability is moderate, and the available water capacity is medium. Plant roots can penetrate effectively to a depth of about 32 inches or more. In the slightly eroded areas, the surface layer has good tilth, but in the severely eroded areas, it is not so friable.

If fertility and organic-matter content are maintained, these soils are suited to most crops grown locally, but not to alfalfa.

The soils should be managed in a way that holds soil losses from erosion within allowable limits. Steepness and length of slope, and the erosion control practices used, govern the minimum cropping system needed. An example of a suitable cropping system on an 8 percent slope 150 feet long is cotton or a similar row crop grown in a grass based rotation. Crops should be planted on the contour in alternating parallel strips and rotated every 2 years.

CAPABILITY UNIT IIIw–2

Chewacla complex, occasionally flooded, the only mapping unit in this capability unit, is somewhat poorly drained and is on flood plains. Slopes range from 0 to 2 percent. The surface layer ranges from silty clay loam to sandy loam. Below this layer, to a depth of about 48 inches, is mottled silty clay loam.

These soils are strongly acid to medium acid. The natural fertility is low, and the content of organic matter is medium. Except in wet spots, tilth is good. Permeability is moderate, the available water capacity is medium, and runoff is slow.

Suitable crops are corn, grain sorghum, tall fescue, common bermudagrass, annual lespedeza, dallisgrass, Coastal bermudagrass, and white clover. These soils normally are not suited to cotton, wheat, alfalfa, sericea lespedeza, or crimson clover.

Excess water is the main concern. To insure optimum crop growth, some drainage may be needed. Water management depends on the crop to be grown. If drainage is needed, a system of main and lateral ditches can be

designed and installed. Either open ditches or covered tile drains can be used.

After the water problem is solved, suitable crops can be grown continuously if good tilth is maintained by returning enough crop residue to the soil. A planned sequence of crops helps in controlling weeds, insects, and disease and in using fertilizer more efficiently.

CAPABILITY UNIT IIIs–1

Only Buncombe loamy sand is in this unit. It is an excessively drained soil on flood plains and is subject to flooding. The surface layer and the layers beneath to a depth of about 26 inches are loamy sand and loamy fine sand. At a depth of 26 to 52 inches is loamy coarse sand.

This soil is mainly very strongly acid to medium acid. The content of organic matter and the natural fertility are low. Tilth is good and plant roots can penetrate effectively to a depth of about 48 inches or more. Permeability is rapid, the available water capacity is low, and runoff is slow.

This soil is suited to Coastal bermudagrass and other perennial plants, but is only moderately well suited to corn, grain sorghum, oats, rye, annual lespedeza, crimson clover, and sericea lespedeza. It generally is not suited to cotton, wheat, alfalfa, or white clover. Crops respond well to good management, but fertilizer is leached out rapidly. Crop sequences that include perennial grasses or legumes are most beneficial. Good management of annual crop residue also is very important.

A suitable cropping system is 2 years or more of Coastal bermudagrass and 1 year of corn or grain sorghum.

CAPABILITY UNIT IVe–1

This unit consists of well-drained, slightly eroded to severely eroded soils of the Appling, Davidson, Holston, Madison, and Pacolet series. Slopes range from 6 to 15 percent. In the less eroded areas, the surface layer is friable sandy loam, gravelly sandy loam, stony sandy loam, or loam. In the more eroded areas, the material is chiefly the clay loam and sandy clay loam formerly in the layers below the original surface layer. Depth to hard rock ranges from about 5 feet to more than 10 feet.

These soils are very strongly acid to medium acid. The natural fertility and the content of organic matter are low. Tilth is good, except in the more eroded areas. Plant roots can penetrate effectively to a depth of more than 36 inches. The available water capacity is medium, and runoff is moderately rapid to rapid on bare surfaces.

Generally, these soils are suited to most of the crops grown locally, but they are better suited to grasses and legumes than to row crops. They are not suited to wheat and alfalfa. Row crops can be grown occasionally if rotated with perennial crops.

These soils should be managed in such a way that holds soil losses from erosion within allowable limits. The steepness and length of slopes and the kind of practice used to control erosion govern the minimum cropping system needed. On a soil that has a slope of 8 percent and is 200 feet long, an example of a suitable cropping system where contour stripcropping is practiced is corn or a similar row crop grown for 2 years followed by fescue or another kind of grass for 4 years.

CAPABILITY UNIT IVe–4

Only the mapping unit Wilkes and Enon soils, 2 to 10 percent slopes, is in this unit. These soils are shallow to moderately deep and are well drained. In most places the surface layer is fine sandy loam, sandy loam, or gravelly sandy loam. Below this layer is sandy clay loam, clay loam, or clay. The Wilkes soils generally have broken rock fragments at a depth of about 18 inches.

These soils are strongly acid to medium acid. The natural fertility and the content of organic matter are low. Tilth is only fair. Permeability is moderately slow to slow, the available water capacity is medium to low, and runoff is medium.

These soils are only fairly well suited to cotton, corn, annual lespedeza, oats, bermudagrass, ryegrass, crimson clover, and sericea lespedeza. They are not suited to alfalfa, tall fescue, white clover, and wheat. Erosion is the chief hazard, and clean-tilled crops should not be grown continuously.

If these soils are cultivated, contour tillage, terracing, grassed waterways, and stripcropping are suitable practices for controlling erosion. An example of a suitable cropping system on a 6 percent slope that is 300 feet long is 3 years of grass followed by 1 year of corn. Crops should be planted on the contour.

CAPABILITY UNIT IVw–1

In this unit are frequently flooded, somewhat poorly drained and poorly drained soils of the Chewacla and Wehadkee series. These soils are on flood plains. Slopes are 0 to 2 percent. The surface layer is variable in texture; it ranges from sandy loam through sandy clay loam and silt loam to silty clay loam. Below the surface layer are thin layers, or strata, of silty clay loam, clay loam, or sandy clay loam.

The soils in this unit are medium acid to very strongly acid. The natural fertility and the content of organic matter are medium to low. Tilth is generally fair to poor. Because the water table is near the surface for long periods, plant roots generally can penetrate effectively to a depth of only about 15 to 24 inches. The available water capacity is medium to high, and runoff is very slow to ponded.

Flooding is the main hazard. In many areas surface drainage is needed for optimum crop growth. In these areas a system that includes both main and lateral ditches can be designed and installed. Water management depends on the kind of crop to be grown.

After these soils are adequately drained, suitable crops can be grown continuously if the soil is kept in good tilth. A planned sequence of crops aids in the control of weeds, insects, and disease and makes use of fertilizer more efficient.

CAPABILITY UNIT IVs–1

Only Molena loamy sand, 2 to 10 percent slopes, is in this unit. This is a somewhat excessively drained soil on the uplands. The surface layer and the layers below are loamy sand to a depth of about 51 inches. Depth to hard rock ordinarily is more than 15 feet.

This soil is strongly acid to very strongly acid. The natural fertility and the content of organic matter are low. Plant roots can penetrate effectively to a depth of more than 48 inches. Infiltration and permeability are rapid, available water capacity is low, and runoff is slow.

This soil is moderately well suited to most of the crops grown locally, including grasses and legumes. The crops respond well to good management, but fertilizer is leached rapidly from this soil. Crop sequences that include perennial grasses or legumes are most beneficial. Contour cultivation and good management of annual crop residue also are essential.

A suitable cropping system for this soil is 2 years or more of Coastal bermudagrass followed by 1 year of corn or grain sorghum.

CAPABILITY UNIT VIe–2

In this unit are well-drained soils of the Cecil, Davidson, and Madison series. These soils are slightly eroded and severely eroded. They have a loamy surface layer, and the layers below are mainly clayey. Slopes range from 6 to 25 percent. Depth to hard rock ranges from about 5 feet to more than 10 feet.

These soils are very strongly acid to medium acid. The natural fertility and the organic-matter content are low. Plant roots generally can penetrate effectively to a depth of about 36 inches or more. Tilth generally is good in the less eroded soils but is poor in the more severely eroded areas. Unless the severely eroded soils are tilled when moist, clods are likely to form. Permeability is moderate, available water capacity is medium, and runoff is medium to rapid.

Ordinarily these soils are not cultivated because tilth is poor, slope is steep, and the hazard of further erosion is severe. Most of the acreage has been cultivated but is now about 85 percent wooded. Establishing stands of grass is somewhat difficult, though most of the grasses and legumes grown locally are suited. If tillage and planting are done on the contour, pasture plants or hay crops can be established. When replanting is done, pasture plants and hay crops should be seeded in alternate strips so as to control erosion. Weakening the plant cover can be avoided if grazing is controlled in pastured areas.

CAPABILITY UNIT VIIe–2

In this unit are mostly well drained to somewhat excessively drained soils that are cobbly and stony. These soils are in the Wilkes, Enon, Mountainburg, and Louisburg series. They occupy narrow ridgetops and hillsides. The surface layer is friable cobbly or stony sandy loam, loamy sand, or fine sandy loam. The next layer ranges from sandy loam to clay loam and clay. Depth to bedrock ranges from about 18 to 48 inches. Slopes range from 6 to 45 percent.

The soils in this unit are very strongly acid to medium acid. The natural fertility and the content of organic matter are low. Tilth is poor in the stony and cobbly areas but is fairly good in other areas. Permeability is slow to rapid, available water capacity is medium to low, and runoff is moderately rapid to rapid.

Cultivated crops are not suited because slopes are steep, the erosion hazard is severe, and the surface layer is gravelly, stony, and cobbly. The less sloping areas can be grazed by cattle. Shortleaf and loblolly pines are suited. The erosion hazard can be controlled if logging roads and firebreaks and other woodland operations are on the contour.

CAPABILITY UNIT VIIe–4

This unit consists of a land type, Gullied land. Gullied land is an intricate pattern of narrow ridges separated by shallow and deep gullies that have steep slopes. The areas generally are small, but in places range to 10 or 20 acres in size.

The soil material is strongly acid or very strongly acid. The natural fertility and the content of organic matter are very low. Runoff is very rapid.

Most of the acreage is wooded or idle. This land is suitable for pine trees, but the gullies and the severe hazard of further erosion make it unsuitable for cultivation and generally undesirable for pasture. Establishing vegetation requires care and skill.

CAPABILITY UNIT VIIIe–1

This unit consists of a land type, Rock land. Hard rock is at or near the surface in most places. Rock land has no value for farming but in places it is a source of crushed stone. Some areas can be developed for recreational use.

Estimated yields

Table 2 gives estimates of average per acre yields for principal crops on the soils of Lamar, Pike, and Upson Counties. The estimates assume a high level of management and are based on records of actual yields on individual farms, on yields obtained in long-term experiments, and on estimates made by agronomists who have had experience with the crops and the soils. Yields are not estimated for some crops on some of the soils. Lack of data in table 2 means that the crop is not suited to the soil.

Generally, the management needed to obtain the yields shown in table 2 is the kind that is described under the heading "Management by capability units." It includes (1) choosing carefully the kind of crop to be planted and the cropping system to be used; (2) preparing a suitable seedbed; (3) using suitable methods for planting, and planting at suitable rates and at appropriate times; (4) providing control of weeds and insect pests; (5) inoculating the seed of legumes; (6) planting high-yielding varieties of crops; (7) controlling water by means of a drainage system, terraces, grassed waterways, and contour cultivation; and (8) applying lime and fertilizer as indicated by soil tests. Special practices for particular crops are as follows:

Corn: Apply 100 to 160 pounds of nitrogen (N) per acre, 40 to 60 pounds of phosphoric acid (P_2O_5), and 60 to 90 pounds potash (K_2O); plant enough seed to produce 12,000 to 15,000 plants per acre; turn under all crop residue.

Cotton: Apply 80 to 120 pounds of nitrogen (N), 50 to 80 pounds of phosphoric acid (P_2O_5), and 75 to 120 pounds of potash per acre; plant enough seeds to grow 25,000 to 40,000 plants per acre; furnish effective insect and weed control.

Oats: Apply 25 to 35 pounds of nitrogen (N), 40 to 60 pounds of phosphoric acid (P_2O_5), and 60 to 90 pounds of potash (K_2O) per acre at planting; drill or broadcast 2 to 4 bushels of seed per acre and topdress late in winter with an additional 45 to 70 pounds of nitrogen per acre; provide adequate control of disease and insects.

Wheat: Apply 60 to 80 pounds of nitrogen (N), 40 to 60 pounds of phosphoric acid (P_2O_5), and 60 to 90 pounds of potash (K_2O) per acre at the time

TABLE 2. *Estimated acre yields of the principal crops grown under a high level of management*

[Yields are assumed to be those of dryland crops. Absence of yields indicates that the crop is not suited to the particular soil or generally is not grown]

Soil	Corn	Cotton lint	Oats	Wheat	Hay		Pasture	
					Sericea lespedeza	Coastal bermudagrass	Tall fescue and white clover	Small grain mixtures
	Bushels	*Pounds*	*Bushels*	*Bushels*	*Tons*	*Tons*	*A.U.M.*[1]	*A.U.M.*
Alluvial land	90	500	50	35	3.0	4.5	6.7	6.0
Altavista sandy loam, 2 to 6 percent slopes	85	500	70	30	3.0	4.5	6.0	5.0
Appling sandy loam, 2 to 6 percent slopes	85	650	80	40	3.5	5.5	6.5	6.0
Appling sandy loam, 6 to 10 percent slopes	75	525	70	35	2.8	4.5	5.4	5.8
Appling sandy clay loam, 2 to 6 percent slopes, severely eroded	45	450	55	30	2.5	4.4	4.7	5.5
Appling sandy clay loam, 6 to 10 percent slopes, severely eroded		425	35	30	2.4	4.0	4.3	4.7
Buncombe loamy sand			40		1.5	5.0		
Cecil sandy loam, 2 to 6 percent slopes, eroded	80	675	75	45	3.2	5.8	6.4	6.2
Cecil sandy loam, 6 to 10 percent slopes, eroded	75	660	70	40	2.9	5.0	6.0	5.8
Cecil sandy loam, 10 to 25 percent slopes								
Cecil sandy loam, 10 to 25 percent slopes, eroded								
Cecil sandy clay loam, 2 to 6 percent slopes, severely eroded	60	450	60	30	2.5	4.5	5.0	5.5
Cecil sandy clay loam, 6 to 15 percent slopes, severely eroded								
Chewacla complex, occasionally flooded	95					5.5	6.9	
Chewacla and Wehadkee soils, frequently flooded	65					4.0	6.7	4.0
Davidson loam, 2 to 6 percent slopes	85	550	80	45	3.5	5.2	6.7	6.0
Davidson loam, 6 to 10 percent slopes, eroded	80	525	75	40	3.0	4.7	5.7	5.5
Davidson loam, 10 to 15 percent slopes, eroded								
Davidson clay loam, 2 to 6 percent slopes, severely eroded	65	450	67	38	2.8	4.5	5.3	5.0
Davidson clay loam, 6 to 10 percent slopes, severely eroded	55	425	50	32	2.6	4.3	5.0	4.8
Davidson clay loam, 10 to 25 percent slopes, severely eroded								
Gullied land								
Helena sandy loam, 2 to 6 percent slopes	60	520	60		2.8	4.0	5.7	4.3
Holston sandy loam, 2 to 6 percent slopes	80	600	75	40	3.6	5.8	6.6	6.2
Holston sandy loam, 6 to 15 percent slopes	70	500	65	30	3.2	5.0	5.1	4.8
Louisburg stony soils, 6 to 15 percent slopes								
Madison sandy loam, 2 to 6 percent slopes, eroded	80	650	70	45	3.2	5.5	6.3	6.1
Madison sandy loam, 6 to 10 percent slopes, eroded	70	600	65	40	3.2	5.5	6.1	5.9
Madison sandy loam, 10 to 15 percent slopes, eroded	60	500	60	35	2.8	5.2	5.9	5.2
Madison sandy loam, 15 to 25 percent slopes								
Madison sandy clay loam, 2 to 6 percent slopes, severely eroded	60	475	45	30	2.3	4.5	4.7	4.0
Madison sandy clay loam, 6 to 15 percent slopes, severely eroded		425	40	25	2.1	4.0	4.0	3.7
Molena loamy sand, 2 to 10 percent slopes	60	500	50	20	2.5	4.0	4.0	5.0
Mountainburg cobbly fine sandy loam, 15 to 45 percent slopes								
Pacolet stony loam, 2 to 6 percent slopes	60	500	40	20	3.0	4.5	4.5	4.5
Pacolet stony loam, 6 to 10 percent slopes	50	450	30	18	3.0	4.5	4.5	4.5
Pacolet gravelly sandy loam, 2 to 6 percent slopes	70	575	65	40	3.0	6.0	6.6	6.2
Pacolet gravelly sandy loam, 6 to 15 percent slopes	65	550	60	35	2.8	5.8	6.2	6.0
Rock land								
Starr soils	85	575	80	38	3.3	6.0	6.7	6.3
Wehadkee silty clay loam, frequently flooded	45						5.1	
Wehadkee soils, frequently flooded								
Wickham gravelly sandy loam, 2 to 6 percent slopes	80	650	80	40	3.2	5.8	6.6	6.2
Wickham gravelly sandy loam, 6 to 10 percent slopes	75	600	75	35	3.0	5.8	6.5	6.0
Wilkes and Enon soils, 2 to 10 percent slopes					2.0	4.2	4.3	3.3
Wilkes and Enon soils, 10 to 25 percent slopes								

[1] Animal-unit-month is used to express the amount of forage or feed required to maintain one animal unit for a period of 30 days.

of planting; late in winter drill or broadcast 1½ to 2 bushels of seed per acre and topdress with an additional 65 pounds of nitrogen per acre; provide effective control of disease and insects.

SERICEA LESPEDEZA: Apply 8 to 10 pounds of nitrogen (N), 40 to 50 pounds each of phosphoric acid (P_2O_5) and potash (K_2O), and 1 ton of lime or basic slag at time of seeding; apply 60 to 80 pounds each of phosphoric acid (P_2O_5) and potash (K_2O) per acre annually thereafter; apply 1 ton of lime or slag at least 1 year out of every 3 or as needed as shown by soil tests.

COASTAL BERMUDAGRASS: For soils on which an estimated yield of 5 tons or more of Coastal bermudagrass hay per acre is shown, the following treatments are required: Apply 100 to 200 pounds of nitrogen (N) per acre, 50 to 70 pounds of phosphoric acid (P_2O_5) and 75 to 105 pounds of potash (K_2O), and 1 to 2 tons of lime when planting. For maintaining high yields after the grass is established, annual applications of high-analysis complete fertilizer plus additional nitrogen are required. Mow to control weeds.

TALL FESCUE AND WHITE CLOVER: Apply 20 to 60 pounds of nitrogen (N) per acre, depending on the effectiveness of the clover in furnishing nitrogen for the grass. Also, apply 40 to 60 pounds of phosphoric acid (P_2O_5) and 60 to 90 pounds of potash (K_2O). Apply 1 ton of lime every 4 years, or apply lime according to the needs indicated by soil tests. Mow to control weeds and to prevent the plants from making excessive growth.

Use of Soils in Town and Country Planning

In selecting a site for a home, a highway, an industry, or other nonfarm use, the suitability of the soils in each site must be determined. The more common properties affecting use of the soils for nonfarm purposes are soil texture, reaction, shrink swell potential, steepness of slopes, depth to hard rock, wetness, and hazard of flooding. These properties were considered in preparing table 3, which gives the limitations of the soils of Lamar, Pike, and Upson Counties for selected nonfarm uses. The limitations are described as *slight*, *moderate*, and *severe*. *Slight* indicates that few or no adjustments are needed,

TABLE 3.—*Degree and kind of limitation*

Soil series and map symbol	Building sites for—		Sewage disposal		Sanitary land fills	Cemeteries
	Residences	Light industries	Septic tank filter fields	Sewage lagoons		
Alluvial land: Alm	Severe: frequent, extremely brief flooding.[1]	Severe: frequent, extremely brief flooding.	Severe: frequent, extremely brief flooding.	Severe:[2] frequent, extremely brief flooding.	Severe: frequent, extremely brief flooding.	Severe: frequent, extremely brief flooding.
Altavista: AlB	Moderate to severe: frequent, extremely brief flooding.	Moderate to severe: frequent, extremely brief flooding.	Moderate to severe: frequent, extremely brief flooding; moderate percolation.	Moderate:[2] frequent, extremely brief flooding.	Moderate to severe: frequent, extremely brief flooding.	Severe: frequent, extremely brief flooding.
Appling:						
AmB	Slight	Moderate: moderate shrink-swell potential.	Moderate: moderate to slow percolation.	Moderate: slope.	Slight	Slight
AmC	Slight	Moderate: moderate shrink-swell potential; slope.	Moderate: moderate to slow percolation.	Severe: slope	Slight	Slight
AnB3	Slight	Moderate: moderate shrink-swell potential.	Moderate: moderate to slow percolation.	Moderate: slope.	Slight	Moderate: sandy clay loam surface layer.
AnC3	Slight	Moderate: slope; moderate shrink-swell potential.	Moderate: moderate to slow percolation.	Severe: slope	Slight	Moderate: sandy clay loam surface layer.

See footnotes at end of table.

and no limitation is listed in table 3. *Moderate* indicates that the soils have unfavorable properties, but the limitation is ordinarily overcome by planning. *Severe* indicates that the limitation is difficult to overcome.

Each of the uses mentioned in table 3 is defined in the paragraphs that follow, and the properties important in rating the limitations of the soils for such uses are given. Investigation should be made at the site before beginning most construction projects.

Building sites for residences. These areas are used for homesites. The ratings and limitations are for houses that are no more than three stories high and have no basements. The properties most important are bearing strength, shrink-swell potential, wetness, flooding, slope, stoniness and rockiness, and shallowness to hard rock. The kind of sewage system is not considered in the evaluation for residences.

Building sites for light industries.—These are sites for stores, offices, and small industries no more than three stories high. Slope, wetness, depth to hard rock, stoniness and rockiness, flooding, shrink-swell potential, and bearing strength are considered. Sewage disposal facilities are assumed to be available but are not considered in the ratings. The slope and shrink-swell potential are more restrictive for building sites for light industries than for residences.

Septic tank filter fields.—This term (*12*) refers to a sewage system in which waste is distributed to a central tank, and the effluent from the tank is dispersed through absorptive field lines buried in the soil. Soil properties most important in rating the soils are wetness, depth to hard rock, flooding, slope, and rate of percolation.

Sewage lagoons.—A sewage lagoon (*3*) consists of an impounded area and a dam. The size considered in the rating is mainly larger than 1.5 acres. The soil properties most important are permeability, suitability of the soil as a site for a reservoir and a dam, depth to hard rock, slope, flood damage, and content of coarse fragments.

Sanitary land fills.—A sanitary land fill is an area used for disposal of household trash and garbage. Such material is buried in the soil. The soil properties most important in constructing and operating such a system are slope, soil texture, depth to hard rock, coarse fragments, wetness and hazard of flooding.

Cemetery sites.—These sites range from about half an

of soils for town and country planning

Recreational facilities					Trafficways	Suitability for topsoil
Picnic areas	Camp areas	Playgrounds	Golf fairways	Paths and trails		
Moderate: frequent, extremely brief flooding.	Severe: frequent, extremely brief flooding.	Moderate to severe: frequent, extremely brief flooding.	Moderate: frequent, extremely brief flooding.	Moderate: frequent, extremely brief flooding.	Severe: frequent, extremely brief flooding.	Good.
Moderate: ponding; seasonal high water table.	Moderate, seasonal high water table; frequent, extremely brief flooding.	Moderate: slope.	Moderate: frequent, extremely brief flooding and ponding.	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Slight	Slight	Moderate: slope.	Slight	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Slight	Moderate: slope.	Severe: slope.	Moderate: slope.	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Moderate: sandy clay loam surface layer.	Moderate: sandy clay loam surface layer.	Moderate: slope.	Moderate to slight: sandy clay loam surface layer.	Moderate: sandy clay loam surface layer.	Moderate: moderate traffic-supporting capacity.	Poor.
Moderate: sandy clay loam surface layer.	Moderate: sandy clay loam surface layer.	Severe: slope.	Moderate to slight: slope; sandy clay loam surface layer.	Moderate: sandy clay loam surface layer.	Moderate: moderate traffic-supporting capacity.	Poor.

TABLE 3.—*Degree and kind of limitation of*

Soil series and map symbol	Building sites for—		Sewage disposal		Sanitary land fills	Cemeteries
	Residences	Light industries	Septic tank filter fields	Sewage lagoons		
Buncombe: Bfs	Severe: frequent, extremely brief flooding.	Severe. frequent, extremely brief flooding.	Severe: frequent, extremely brief flooding.	Severe: rapid permeability.	Severe. frequent, extremely brief flooding.	Severe: frequent, extremely brief flooding.
Cecil:						
CYB2	Slight	Moderate: moderate shrink-swell potential.	Moderate: moderate percolation.	Moderate: slope.	Slight	Slight
CYC2	Slight	Moderate: moderate shrink-swell potential; slope.	Moderate: moderate percolation.	Severe: slope	Slight	Slight
CYE	Moderate to severe: slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
CYE2	Moderate to severe: slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
CZB3	Slight	Moderate: moderate shrink-swell potential.	Moderate: moderate percolation.	Moderate: slope.	Slight	Slight
CZD3	Slight to moderate: slope.	Moderate to severe: slope.	Moderate to severe: moderate percolation; slope.	Severe: slope	Moderate: slope.	Moderate: slope.
Chewacla: Cco	Severe: frequent, brief flooding; seasonal high water table.	Severe: frequent, brief flooding; seasonal high water table.	Severe: frequent, brief flooding; seasonal high water table.	Moderate:[2] frequent, brief flooding.	Severe: frequent, brief flooding; seasonal high water table.	Severe: frequent, brief flooding; seasonal high water table.
Chewacla and Wehadkee, Cwf.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Severe:[2] very frequent, brief flooding.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.
Davidson:						
DgB	Slight	Moderate: moderate to high shrink-swell potential.	Slight	Moderate: slope.	Slight	Slight
DgC2	Slight	Moderate: moderate to high shrink-swell potential; slope.	Slight	Severe: slope	Slight	Slight
DgD2	Moderate: slope.	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.	Moderate: slope.

See footnotes at end of table.

soils for town and country planning—Continued

Recreational facilities					Trafficways	Suitability for topsoil
Picnic areas	Camp areas	Playgrounds	Golf fairways	Paths and trails		
Moderate: frequent, extremely brief flooding.	Moderate to severe: frequent, extremely brief flooding.	Moderate to severe: frequent, extremely brief flooding.	Moderate. frequent, extremely brief flooding.	Moderate: frequent, extremely brief flooding.	Severe: frequent, brief flooding.	Poor.
Slight	Slight	Moderate: slope	Slight	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Slight	Slight	Severe: slope	Moderate: slope	Slight	Moderate: moderate traffic-supporting capacity	Fair.
Moderate to severe: slope.	Moderate to severe: slope.	Severe: slope	Severe: slope	Moderate: slope	Moderate to severe: moderate traffic-supporting capacity; slope.	Fair.
Moderate to severe: slope.	Moderate to severe: slope.	Severe. slope	Severe: slope	Moderate. slope.	Moderate to severe: moderate traffic-supporting capacity; slope.	Fair.
Moderate: sandy clay loam surface layer.	Moderate: sandy clay loam surface layer.	Moderate: slope	Slight to moderate: sandy clay loam surface layer.	Moderate: sandy clay loam surface layer.	Moderate: moderate traffic-supporting capacity.	Poor.
Moderate: sandy clay loam surface layer.	Moderate: sandy clay loam surface layer; slope.	Severe: slope	Moderate: sandy clay loam surface layer; slope.	Moderate: sandy clay loam surface layer.	Moderate: moderate traffic-supporting capacity; slope.	Poor.
Severe: frequent, brief flooding seasonal high water table.	Severe: frequent, brief flooding seasonal high water table.	Severe: frequent, brief flooding.	Severe: frequent, brief flooding seasonal high water table.	Severe: frequent, brief flooding, seasonal high water table.	Severe: frequent, brief flooding, seasonal high water table.	Good.
Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding, seasonal high water table.	Severe: very frequent, brief flooding.	Severe: frequent, brief flooding	Severe seasonal high water table.	Severe: frequent, brief flooding.	Poor.
Slight	Slight	Moderate: slope	Slight	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Slight	Slight	Severe: slope	Moderate: slope	Slight	Moderate: moderate traffic-supporting capacity	Fair to poor.
Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Slight	Moderate: moderate traffic-supporting capacity; slope.	Fair to poor.

TABLE 3. *Degree and kind of limitation of*

Soil series and map symbol	Building sites for—		Sewage disposal		Sanitary land fills	Cemeteries
	Residences	Light industries	Septic tank filter fields	Sewage lagoons		
Davidson—Continued						
DhB3	Slight	Moderate: moderate to high shrink-swell potential.	Slight	Moderate: slope.	Slight	Moderate: clay loam surface layer.
DhC3	Slight	Moderate: moderate to high shrink-swell potential; slope.	Moderate: slope.	Severe: slope	Slight	Moderate: clay loam surface layer.
DhE3	Moderate to severe slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Gullied land: GuL	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: clayey surface layer.
Helena: HYB	Severe: moderate to high shrink-swell potential.	Severe: moderate to high shrink-swell potential.	Severe: slow percolation.	Moderate: slope.	Moderate: rock at a depth of 4 to 6 feet.	Moderate: rock at a depth of 4 to 6 feet.
Holston:						
HVB	Slight	Moderate: moderate shrink-swell potential.	Moderate: moderate percolation.	Moderate: slope; moderate permeability.	Slight	Slight.
HVD	Slight to moderate: slope.	Moderate: moderate shrink-swell potential; slope.	Moderate: moderate percolation; slope.	Severe: slope	Slight to moderate: slope.	Slight to moderate: slope.
Louisburg: LmD	Severe: rock at a depth of 2 to 3 feet.	Severe: rock at a depth of 2 to 3 feet.	Severe: rock at a depth of 2 to 3 feet.	Severe: slope; rock at a depth of 2 to 3 feet.	Severe: rock at a depth of 2 to 3 feet.	Severe: rock at a depth of 2 to 3 feet.
Madison:						
MgB2	Moderate: moderate shrink-swell potential.	Moderate: moderate shrink-swell potential.	Moderate: moderate percolation.	Moderate: slope.	Slight	Slight
MgC2	Moderate: moderate shrink-swell potential.	Moderate: moderate shrink-swell potential; slope.	Moderate: moderate percolation.	Severe: slope	Slight	Slight
MgD2	Moderate: moderate shrink swell potential; slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.	Moderate: slope.

See footnotes at end of table.

soils for town and country planning –Continued

Recreational facilities					Trafficways	Suitability for topsoil
Picnic areas	Camp areas	Playgrounds	Golf fairways	Paths and trails		
Moderate: clay loam surface layer.	Moderate: clay loam surface layer.	Moderate: slope	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.	Moderate: moderate traffic-supporting capacity.	Poor.
Moderate: clay loam surface layer.	Moderate: clay loam surface layer; slope.	Moderate: slope	Moderate: clay loam surface layer; slope.	Moderate: clay loam surface layer.	Moderate: moderate traffic-supporting capacity.	Poor.
Severe: clay loam surface layer, slope.	Severe: slope; clay loam surface layer.	Severe: slope	Severe. slope	Moderate: slope	Moderate: moderate traffic-supporting capacity and erodibility, slope.	Poor.
Severe: clayey surface layer.	Severe: clayey surface layer.	Severe: clayey surface layer.	Severe: clayey surface layer.	Severe: clayey surface layer; slope.	Severe: severe erosion.	Poor.
Slight	Severe: slow permeability.	Severe: slow permeability.	Moderate: ponding.	Slight	Severe: moderate to high shrink-swell potential.	Fair.
Slight	Slight	Moderate: slope	Slight	Slight	Moderate: moderate traffic-supporting capacity.	Good.
Moderate: slope.	Moderate: slope.	Severe: slope	Moderate: slope	Slight	Moderate: moderate traffic-supporting capacity; slope.	Good.
Severe: stony surface.	Severe: stony surface.	Severe: slope	Severe: stony surface.	Moderate: stony surface.	Severe: slope	Poor.
Slight	Slight	Moderate: slope	Slight	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Slight	Slight	Severe: slope	Moderate: slope	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Moderate: slope.	Moderate: slope.	Severe: slope	Moderate: slope.	Slight	Moderate. slope; moderate traffic-supporting capacity.	Fair

TABLE 3.—*Degree and kind of limitation of*

Soil series and map symbol	Building sites for—		Sewage disposal		Sanitary land fills	Cemeteries
	Residences	Light industries	Septic tank filter fields	Sewage lagoons		
Madison—Continued MgE	Moderate: moderate shrink-swell potential, slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
MrB3	Slight	Moderate: moderate shrink-swell potential.	Moderate: moderate percolation.	Moderate: slope	Slight	Slight
MrD3	Slight to moderate: slope.	Moderate to severe: slope	Moderate: moderate percolation; slope.	Severe: slope	Moderate: slope.	Moderate: slope.
Molena: MtC	Slight to moderate: slope.	Moderate: slope; moderate bearing strength.[3]	Slight to moderate: slope	Severe: rapid percolation; slope	Slight	Slight
Mountainburg: MHF	Severe: shallowness over rock, slope.	Severe: shallowness over rock, slope.	Severe: shallowness over rock; slope.	Severe: shallowness over rock; slope.	Severe: cobblestones; slope.	Severe: cobblestones; slope.
Pacolet: PkB	Moderate: broken rock fragments at a depth of 3 to 5 feet	Moderate: moderate shrink-swell potential.	Moderate: broken rock fragments at a depth of 3 to 5 feet.	Moderate: slope.	Severe: broken rock fragments at a depth of 3 to 5 feet.	Moderate: stony surface.
PkC	Severe: broken rock fragments at a depth of 3 to 5 feet.	Severe: broken rock fragments at a depth of 3 to 5 feet.	Moderate: broken rock fragments at a depth of 3 to 5 feet.	Severe: slope; stones.	Severe: broken rock fragments at a depth of 3 to 5 feet.	Severe: broken rock fragments at a depth of 3 to 5 feet.
PmB	Slight	Moderate: moderate shrink-swell potential	Moderate: moderate percolation.	Moderate: slope.	Slight	Slight
PmD	Slight	Moderate to severe: moderate shrink-swell potential; slope.	Moderate to severe: moderate percolation, slope.	Severe: slope	Slight	Slight to moderate: slope.
Rock land: Roc	Severe: rock at the surface.	Severe: rock at the surface.	Severe: rock at the surface	Severe: rock at the surface.	Severe: rock at the surface	Severe: rock at the surface.
Starr: Sto	Slight	Moderate: moderate to low bearing strength.[3]	Slight	Moderate to severe: moderately rapid permeability.	Slight	Slight

See footnotes at end of table

soils for town and country planning—Continued

Recreational facilities					Trafficways	Suitability for topsoil
Picnic areas	Camp areas	Playgrounds	Golf fairways	Paths and trails		
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: moderate traffic-supporting capacity slope	Poor.
Moderate: sandy clay surface layer.	Moderate: sandy clay loam surface layer.	Moderate: slope	Slight to moderate: sandy clay loam surface layer.	Moderate: sandy clay loam surface layer.	Moderate: moderate traffic-supporting capacity; moderate erosion hazard.	Poor.
Moderate: slope.	Moderate slope; sandy clay loam surface layer.	Severe: slope	Moderate slope; sandy clay loam surface layer.	Moderate: sandy clay loam surface layer.	Moderate: moderate traffic-supporting capacity, moderate erosion hazard	Poor.
Slight to moderate: loamy sand surface layer.	Slight to moderate: loamy sand surface layer.	Slight to moderate: loamy sand surface layer.	Moderate: low available water capacity; plant growth poor.	Slight to moderate: loamy sand surface layer.	Slight	Poor.
Severe: cobblestones, slope.	Severe: cobblestones; stones; slope.	Severe: slope; cobbly surface.	Severe: cobblestones, rock; slope.	Moderate to severe: cobblestones; slope.	Moderate to severe: shallowness to rock; slope.	Poor.
Moderate: stony surface.	Moderate: stony surface	Severe: stony surface.	Severe: stony surface.	Moderate: stony surface.	Severe: broken rock fragments at a depth of 3 to 5 feet.	Poor.
Moderate: stony surface.	Moderate: stony surface.	Severe: slope	Severe: stony surface.	Moderate: stony surface.	Severe: slope; broken rock at a depth of 3 to 5 feet.	Poor.
Slight	Slight	Moderate: slope.	Slight	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Slight to moderate: slope.	Slight to moderate: slope.	Severe: slope	Moderate: slope	Slight	Moderate: moderate traffic-supporting capacity.	Fair.
Moderate: rock at the surface.	Severe: rock at the surface.	Severe: rock at the surface.	Severe: rock at the surface.	Severe: rock at the surface.	Severe: rock at the surface.	Poor.
Slight	Slight	Slight	Slight	Slight	Moderate: moderate traffic-supporting capacity.	Fair to good.

TABLE 3.—*Degree and kind of limitation of*

Soil series and map symbol	Building sites for—		Sewage disposal		Sanitary land fills	Cemeteries
	Residences	Light industries	Septic tank filter fields	Sewage lagoons		
Wehadkee:						
Wed	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: [1] very frequent, brief flooding.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.
Weh	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: [1] very frequent, brief flooding.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.
Wickham:						
WsB	Slight	Moderate: moderate shrink-swell potential.	Slight	Moderate: slope.	Slight	Slight
WsC	Slight	Moderate: slope.	Moderate: slope.	Severe: slope	Slight	Slight
Wilkes and Enon:						
WEC	Severe: high shrink-swell potential, rock at a depth of 1½ feet.	Severe: high shrink-swell potential; rock at a depth of 1½ feet.	Severe: slow percolation.	Severe: slope; rock at a depth of 1½ feet.	Severe: rock at a depth of 1½ feet.	Severe: rock at a depth of 1½ feet.
WEE	Severe: high shrink-swell potential; slope.	Severe: high shrink-swell potential.	Severe: slow percolation; slope.	Severe: slope	Severe: rock at a depth of 1½ feet.	Severe: slope

[1] *Very frequent* means the flood hazard is more often than once every year; *frequent* means the hazard is once in 5 years, *extremely brief* means the flood lasts less than 2 days; *brief* means the flood lasts from 7 days to 1 month.

acre to more than 10 acres in size. The small sites are near county churches, but large memorial parks and other cemeteries are likely to be centrally located. The soil properties most important are slope, texture, stoniness, depth to hard rock, wetness, and the hazard of flooding.

Recreational facilities.—The recreational facilities (*13*) considered in table 3 are picnic areas, camp areas, playgrounds, golf fairways, and paths and trails.

Picnic areas are park-type picnic areas that are subject to heavy foot traffic. Most of the vehicular traffic is confined to access roads. Play areas and waste disposal areas are treated as separate items, and site preparation consists mainly of leveling sites for tables and fireplaces. Wetness, flooding, slope, texture of the surface layer, stoniness, and rockiness are the soil properties considered.

Camp areas are areas used intensively for tents and small camp trailers and the accompanying activities for outdoor living. It is assumed that the site preparation ordinarily required is leveling for tent trailers and parking areas. These areas are subject to heavy foot traffic. Vehicular traffic is confined mainly to access roads. The important soil properties are wetness, flooding, permeability, slope, texture of the surface layer, stoniness, and rockiness.

Playgrounds are areas used intensively for play; for example, baseball, badminton, and other organized games. Extensive site preparation is not needed. Important soil properties are wetness, flooding, permeability, texture of the surface layer, rockiness, and stoniness.

Golf fairways refer only to the fairways; golf greens are manmade. The important soil properties are flooding, wetness, slope, permeability, texture of the surface layer, depth to rock, and stoniness.

Paths and trails, which are areas used for cross-country hiking, bridle paths, and other nonintensive use, are used as they occur in nature. Wetness, flooding, slope, texture of the surface layer, rockiness, and stoniness are the important properties.

Trafficways.—Trafficways refer to low-cost roads and residential streets that require limited cut and fill and subgrade preparation. The properties most important in rating the soils for trafficways are slope, depth to hard rock, wetness, flooding, rockiness, stoniness, and traffic-supporting capacity.

Topsoil. This is soil material suitable for use on areas where vegetation is to be established and maintained. The soil properties considered are productivity, rockiness, stoniness, and depth of the material at the source of supply. The ratings used are *good*, *fair*, and *poor*.

soils for town and country planning Continued

Recreational facilities					Traffieways	Suitability for topsoil
Picnic areas	Camp areas	Playgrounds	Golf fairways	Paths and trails		
Severe: very frequent, brief flooding, seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: seasonal high water table.	Severe: very frequent, brief flooding.	Severe: very frequent, brief flooding, seasonal high water table.	Severe: very frequent, brief flooding, seasonal high water table.	Poor.
Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding, seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding.	Severe: very frequent, brief flooding; seasonal high water table.	Severe: very frequent, brief flooding; seasonal high water table.	Poor.
Slight	Slight	Moderate: slope.	Slight	Slight	Slight	Fair.
Slight	Slight	Severe: slope	Moderate: slope.	Slight	Slight	Fair.
Moderate: stones on the surface.	Moderate to severe. slow to moderately slow permeability.	Moderate to severe. slow to moderately slow permeability.	Moderate: slope; rock at a depth of 1½ feet.	Slight	Severe: low traffic-supporting capacity, rock at a depth of 1½ feet.	Poor.
Severe: slope	Severe: slope	Severe: slope	Severe: slope; rock at a depth of 1½ feet.	Moderate: slope.	Severe: low traffic-supporting capacity; rock at a depth of 1½ feet.	Poor.

[2] In local areas where the probable flood damage to a dam is slight, the degree of limitations is reduced.
[3] In considering the ratings for bearing capacity, engineers and others should not apply specific values to the estimates given.

Use of the Soils in Engineering[3]

Soil properties are of special interest to engineers because they affect the construction and maintenance of roads, streets, airports, building foundations, structures for controlling erosion, facilities for storing and transporting water, systems for draining and irrigating soils, and absorptive fields used for septic tanks. Among the soil properties most important to engineers are permeability to water, shear strength, compaction characteristics, shrink-swell characteristics, soil drainage, available water capacity, grain size, plasticity, and reaction. Depth to the water table, depth to bedrock or to sand and gravel, and relief also are important.

The information in this survey can be used to—

1. Make soil and land use studies that will aid in selecting and developing sites for industries, businesses, residences, and recreational areas.
2. Make preliminary estimates of engineering properties of soils to be used in planning agricultural drainage systems, farm ponds, irrigation systems, terraces and diversions, waterways, and other structures.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, airports, pipelines, cables, and sewage disposal fields and in planning detailed surveys of the soils at selected locations.
4. Locate probable sources of sand, gravel, and other material for use in location and preliminary construction.
5. Correlate performance of engineering structures with soil mapping units and thus develop information that will be useful in designing and maintaining the structures.
6. Determine the suitability of soil mapping units for cross-country movement of vehicles and construction equipment.
7. Supplement the information obtained from other published maps, reports, and aerial photographs for the purpose of making reports that can be used readily by engineers.
8. Develop preliminary estimates for construction purposes pertinent to the particular area.

With the soil map for identification of soil areas, the engineering interpretations reported in tables 4, 5, and 6 can be useful for many purposes. It should be emphasized,

[3] FELTON B. FLOURNOY, agricultural engineer, Soil Conservation Service, helped in preparing this section.

TABLE 4.—*Engineering*

[Tests performed by State Highway Department of Georgia, in accordance with standard

Soil name and location	Parent material	Report no. S64-Ga	Depth	Moisture density [1]		Volume change			Mechanical analysis [2]		
				Maximum dry density	Optimum moisture	Shrinkage	Swelling	Total volume change	Percentage passing sieve		
									3-in.	2-in.	1½-in.
			Inches	*Pounds per cubic foot*	*Percent*	*Percent*	*Percent*	*Percent*			
Appling sandy loam. Upson County: Pit in field of planted pines, west side of Barnesville-Yatesville Road, 0.3 mile North of Antioch Church. (Modal.)	Acid granite and granite gneiss.	145–1 1 1–4 1 5	0–8 16–32 32–50	117 104 98	10 19 22	0. 8 4. 9 0. 4	6. 9 4. 6 4. 8	7. 7 9. 4 14. 2		100	99
Upson County: Road cut north side of south Delray Road, 1.1 miles east of U.S. Highway No. 19. (Finer textured than the modal.)	Acid granite and granite gneiss.	145–2–1 2–3 2–4	0–10 16–24 24 60	118 102 112	11 19 15	1. 5 7. 2 4. 3	11. 4 4. 6 3. 2	12. 9 11. 8 7. 5			100
Upson County: Pit in wooded area south side Vickery Road, 0.5 mile west on U.S. Highway No. 19. (Coarser textured than the modal.)	Acid granite and granite gneiss.	145–3–1 3–4 3–5	0–8 18–29 29–39	118 104 101	11 21 20	2. 2 8. 9 9. 4	1. 5 4. 5 4. 9	3. 7 13. 4 14. 3			
Helena sandy loam. Lamar County: Pit in wooded area south side of dirt road, 50 feet east of pond, 350 yards west of U.S Highway No 41 (Modal.)	Acid granite and granite gneiss.	85–5–1 5–2 5–4	0–6 6–12 16–48	115 122 100	12 10 20	0. 8 1. 8 5. 2	6. 1 3. 6 28. 0	6. 9 5. 4 33. 2			
Lamar County: 25 feet south of Southern Railroad crossing at Piedmont. (Finer textured than the modal.)	Acid granite and granite gneiss.	85–1–1 1–4 1–5	0–10 17–28 28–48	110 99 96	10 18 24	1. 7 7 2 5. 3	4. 6 5. 6 16. 4	6. 3 12. 8 21. 7			
Holston sandy loam. Pike County: Road cut west side of county road, 1 mile south John Alexander farm. (Fine textured.)	Colluvial material from acid quartzite and sandstone.	114–1–1 1–4 1–5	0 3 21–46 46–60	125 113 110	10 16 17	0. 3 4. 7 4. 4	1. 1 4. 6 7. 1	1. 4 9. 3 11. 5		100 100	99 99
Pike County: Road cut north side of road, 250 yards east of Vega. (Coarse textured.)	Colluvial material from acid quartzite and sandstone.	114–6–3 6–4 6–5	8–21 21–39 39–52	123 114 116	8 14 14	1. 5 6. 0 2. 0	5. 1 1. 9 7. 3	6. 6 7 9 9. 3			

See footnotes at end of table.

test data

procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Mechanical analysis [2]—Continued												Classification	
Percentage passing sieve—Continued							Percentage smaller than—				Liquid limit	Plasticity index	AASHO [3]	Unified [4]
1-in.	¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
											Percent			
99	99	98	97	94	74	24	19	14	7	5		NP	A–2–4(0)	SM
			100	96	85	55	53	48	40	37	37	14	A–6(6)	ML–CL
				100	86	59	58	53	45	42	42	16	A–7–6(7)	ML–CL
98	96	94	93	90	69	26	22	18	8	6		NP	A–2–4(0)	SM
			100	99	91	62	62	57	48	46	44	26	A–7–6(12)	CL
			100	98	80	44	41	36	30	28	30	13	A–6(3)	SC
100	99	99	99	98	59	30	25	19	10	6		NP	A–2–4(0)	SM
		100	99	97	79	58	56	50	39	35	43	18	A–7–6(9)	ML–CL
	100	98	98	96	75	55	54	49	41	38	45	17	A–7–6(8)	ML–CL
			100	98	62	25	22	16	9	4		[5]NP	A–2–4(0)	SM
		100	99	94	59	34	31	25	16	12	21	NP	A–2–4(0)	SM
		100	99	96	75	55	53	52	44	40	53	26	A 7 6(12)	MH–CH
	100	98	96	92	67	24	18	14	6	6		NP	A–2–4(0)	SM
100	99	98	96	91	74	52	51	49	42	38	42	20	A–7–6(7)	CL
			100	99	89	63	62	59	54	36	55	22	A–7–5(12)	MH
97	92	84	78	74	57	23	19	16	10	6		NP	A 2–4(0)	SM
100	98	95	94	90	71	38	36	33	27	26		NP	A–4(1)	SM
98	94	89	86	81	62	34	32	28	23	21	32	10	A–2–4(0)	SM–SC
		100	98	93	76	37	29	20	10	4		NP	A 4(1)	SM
			100	97	82	56	51	42	29	23	29	13	A–6(5)	CL
			100	98	82	52	47	38	24	22	26	10	A–4(3)	CL

TABLE 4.—*Engineering*

Soil name and location	Parent material	Report no. S64-Ga	Depth	Moisture density [1]		Volume change			Mechanical analysis [2]		
				Maximum dry density	Optimum moisture	Shrinkage	Swelling	Total volume change	Percentage passing sieve		
									3-in.	2-in.	1½-in.
			Inches	*Pounds per cubic foot*	*Percent*	*Percent*	*Percent*	*Percent*			
Madison sandy loam. Lamar County: Pit in field south side county road at intersection, 0.25 mile west of U.S. Highway No. 41, 1 mile south of Orchard Hill. (Modal)	Mica schist and quartz mica schist.	85-6-1	0-7	125	10	1.3	1.7	3.0		100	99
		6-4	15-27	95	26	13.1	5.8	18.9			
		6-6	41-60	97	23	7.6	8.8	16.4			
Lamar County: Road cut north side of road, 2 miles southeast Barnesville on Gordon Road (Finer textured than the modal.)	Mica schist and quartz mica schist.	85-3-1	0-8	119	11	1.0	7.2	8.2			
		3-4	24-36	101	23	5.6	8.0	13.6			
		3-5	36-42	95	24	10.6	9.2	19.8			
Lamar County: Road cut west side county road, 1¼ miles east U.S. Highway No. 41, 2¼ miles north Milner. (Coarser textured than the modal.)	Mica schist and quartz mica schist.	85-4-2	0-4	119	12	0.5	5.9	6.4			100
		4-5	13-27	101	20	5.9	4.8	10.7			
		4-6	27-60	98	23	7.7	5.5	13.2			
Molena loamy sand. Pike County: Pit in field east of county road, 0.5 mile south Pedenville. (Modal.)	Alluvial deposits.	114-3-2	7-18	107	13	.0	1.9	1.9			
		3-3	18-51	107	12	.0	.7	.7			
		3-4	51-60	100	14	.0	1.0	1.0			
Pike County: Pit in pasture, 125 yards west of Lawrence Lake Road, 1½ miles west of Molena, Ga. (Coarser textured than modal.)	Alluvial deposits.	114-4-1	0-11	103	14	.0	2.7	2.7			
		4-3	20-42	104	13	.0	.0	.0			
		4-4	42-60	103	15	.0	0.6	0.6			
Pacolet gravelly sandy loam. Pike County: Pit in wooded area 0.5 mile north of Upson County line on Hagan Road. (Modal.)	Acid sandstone, quartzite, and some mica schist.	114-7-1	0-4	129	9	.1	1.0	1.1	100	99	97
		7-2	4-12	124	10	1.0	2.7	3.7			100
		7-4	17-33	91	27	8.5	6.4	14.9			
Upson County: Pit in vineyard 0.5 mile south of Jeff Davis Road. (Modal.)	Residuum from acid sandstone, quartzite, and mica schist.	145-3-1	0-5	123	10	1.4	2.3	3.7			100
		3-2	5-12	109	15	4.4	.1	4.5			
		3-3	12-23	105	19	5.3	2.5	7.8			

See footnotes at end of table.

test data—Continued

Mechanical analysis [2]—Continued											Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Continued							Percentage smaller than						AASHO [3]	Unified [4]
1-in.	¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
												Percent		
99	98	92	85	78	54	23	21	14	9	7		NP	A 2-4(0)	SM
		100	99	98	91	72	72	65	55	51	51	24	A-7-6(15)	MH-CH
			100	98	90	66	63	53	40	35	46	20	A 7-6(11)	ML-CL
		100	98	96	76	29	23	17	10	8		NP	A 2-4(0)	SM
		100	98	97	85	60	59	58	50	44	43	16	A-7 6(8)	ML-CL
			100	98	90	61	59	55	44	41	48	10	A-5(7)	ML
99	97	88	78	68	50	26	25	20	11	7		NP	A 2-4(0)	SM
	100	99	97	92	80	57	56	53	43	32	43	17	A-7-6(8)	MLCL
			100	97	75	57	56	52	45	40	47	16	A-7-5(7)	ML
				100	68	10	10	10	7	7		NP	A 3(0)	SP-SM
				100	72	10	10	10	7	7		NP	A-3(0)	SP-SM
				100	59	5	5	5	4	4		NP	A-3(0)	SP-SM
				100	58	8	7	7	5	3		NP	A-3(0)	SP-SM
				100	55	7	7	5	5	5		NP	A-3(0)	SP-SM
				100	75	8	8	8	6	5		NP	A 3(0)	SP-SM
86	76	54	46	43	32	14	14	11	6	3		NP	A-2-4(0)	GM
99	99	91	85	78	56	25	24	22	11	8		NP	A 2-4(0)	SM
	100	99	98	95	86	75	73	70	64	60	55	22	A 7 5(16)	MH
99	97	92	90	87	67	28	26	25	19	17	16	2	A-2-4(0)	SM
100	98	95	94	89	69	46	45	44	39	36	44	27	A-7-6(8)	SC
	100	95	93	86	58	39	39	39	35	35	37	14	A 6(2)	SM-SC

TABLE 4.—*Engineering*

Soil name and location	Parent material	Report no. S64-Ga	Depth	Moisture density [1]		Volume change			Mechanical analysis		
				Maximum dry density	Optimum moisture	Shrinkage	Swelling	Total volume change	Percentage passing sieve		
									3-in.	2-in.	1½-in.
			Inches	*Pounds per cubic foot*	*Percent*	*Percent*	*Percent*	*Percent*			
Upson County: Road cut in wooded area west side of Turner Lake Road, 0.5 mile south of Pike County line. (Finer textured than the modal).	Residuum from acid sandstone, quartzite, and mica schist.	145–2–1	0–2	110	13	3.5	9.9	13.4			
		2–3	12–24	94	24	7.3	.4	7.7			
		2–4	24–38	96	22	5.6	5.1	10.7			
Wickham gravelly sandy loam. Upson County: Pit in wooded area north side Willingham Spring Road, 0.5 mile east intersection Jeff Davis Road. (Modal).	Old colluvial material from acidic quartzite and sandstone.	145–5–2	2–12	123	10	.1	1.6	1.7			
		5–4	22–30	106	18	2.4	3.8	6.2			
		5–5	30–48	113	14	3.7	2.2	5.9			
Upson County: Road cut side of Dripping Rocks Road, 1 mile west of Thunder Boy Scout Camp. (Finer textured than the modal.)	Old colluvial material from acidic quartzite and sandstone.	145–6–1	0–8	112	13	1.0	13.1	14.1	100	94	94
		6–4	30–45	119	12	5.1	4.3	9.4			100
		6–5	45–60	113	14	13.2	3.0	16.2		100	98
Upson County: Road cut north side of Willingham Spring Road, 1.1 miles west of Atwater Road intersection. (Coarser textured than modal.)	Old colluvial material from acidic quartzite and sandstone.	145–4–2	3–15	126	9	.1	.0	.1		100	98
		4–5	34–54	117	12	1.7	3.3	5.0			100
		4–6	54–72	118	13	1.9	1.9	3.8			100

[1] Based on AASHO Designation T 99–57.

[2] Mechanical analysis according to the AASHO Designation T 88–57 (*1*). Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical

test data Continued

Mechanical analysis [2]—Continued										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Continued							Percentage smaller than—						
1-in.	¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2 0 mm.)	No. 40 (0.42 mm.)	No 200 (0 074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO [3]	Unified [4]
											Percent		
------	100	93	88	79	72	45	37	28	20	18	- - -	NP	A 4(2)	SM
------	100	99	97	92	89	70	65	62	55	53	47	17	A–7–5(12)	ML
- - ---	100	98	97	94	86	65	61	56	51	49	44	13	A–7–5(7)	ML–CL
100	99	97	98	91	64	34	21	18	11	8	-- -	NP	A 2–4(0)	SM
100	99	98	96	90	72	44	42	41	36	35	35	13	A–6(3)	SM SC
------	------	- --	100	98	68	36	35	32	26	25	30	13	A–6(2)	SC
93	91	86	80	78	67	28	24	18	8	6	-- -	NP	A 2–4(0)	SM
98	96	93	91	88	79	49	48	42	32	29	27	13	A–6(4)	SC
96	94	91	88	87	77	49	47	42	35	34	33	13	A–6(4)	SC
94	89	81	76	67	42	18	16	11	6	5	--- -	NP	A 2 4(0)	SM
98	97	93	91	82	52	29	28	27	22	20	27	12	A 2–6(0)	SC
97	95	90	88	78	48	30	30	28	25	24	31	12	A 2–6(0)	SC

analyses used in this table are not suitable for use in naming textural classes for soils.

[3] Based on AASHO Designation: M 145–49 (*1*).

[4] Based on the Unified Soil Classification System. SCS and Bureau of Public Roads have agreed to consider that all soils having plasticity indexes within two points from A-line are to be given a borderline classification. Examples of borderline classifications obtained by this use are ML–CL and SP–SM.

[5] Nonplastic.

TABLE 5. *Estimated*

[The properties of Gullied land and Rock

Soil series and map symbol	Depth to bedrock	Depth to seasonal high water table	Depth from surface	Classification: USDA texture
Alluvial land: Alm.[1]	*Feet*	*Inches*	*Inches*	
Altavista: AlB	>5	24–30	0–12	Sandy loam
			12–52	Sandy clay loam
Appling: AmB, AmC, AnB3,[2] AnC3[2]	>8	>48	0–8	Sandy loam
			8–50	Clay
Buncombe: Bfs	>6	>60	0–26	Loamy sand and loamy fine sand
			26–52	Loamy coarse sand
Cecil: CYB2, CYC2, CYE, CYE2, CZB3,[2] CZD3.[2]	>10	>60	0–8	Sandy loam
			8–11	Sandy clay loam
			11–60	Clay or clay loam
Chewacla: Cco, Cwf. For Wehadkee part of Cwf, refer to Wehadkee series.	>10	0–20	0–48	Silty clay loam
Davidson: DgB, DgC2, DgD2, DhB3,[2] DhC3,[2] DhE3.[2]	>10	>60	0–6	Loam
			6–49	Clay
			49–100	Sandy clay loam
Enon. Mapped only with Wilkes soils.	>6	>48	0–4	Fine sandy loam
			4–10	Clay loam
			10–22	Clay
			22–48	Clay loam
			48	Weathered rock.
Helena: HYB	4–6	20–30	0–8	Sandy loam
			8–13	Sandy clay loam
			13–52	Clay or sandy clay
Holston: HVB, HVD	4–6	>60	0–5	Sandy loam
			5–11	Light sandy clay loam
			11–60	Sandy clay loam
Louisburg: LmD	2–3	>60	0–6	Coarse sandy loam
			6–18	Sandy loam
			18–24	Saprolite rock.
			24	Hard granite.
Madison: MgB2, MgC2, MgD2, MgE, MiB3,[2] MiD3.[2]	>5	>60	0–7	Sandy loam
			7–15	Clay loam
			15–41	Clay
			41–60	Weathered mica schist.
Molena: MtC	>5	>60	0–51	Loamy sand and loamy fine sand
			51–60	Coarse sand
Mountainburg: MHF	1½–2	>60	0–4	Cobbly fine sandy loam
			4–14	Gravelly sandy clay loam
			14–20	Sandstone (weathered) rock
			20	Hard sandstone.
Pacolet: PkB, PkC, PmB, PmD	>6	60	0–12	Gravelly sandy loam
			12–17	Heavy sandy clay loam
			17–33	Clay
			33–50	Clay loam and coarse fragments
Starr: Sto	10	60	0–8	Sandy loam
			8–52	Clay loam
			52–60	Sandy clay loam

See footnotes at end of table.

properties

land are too variable to be estimated]

Classification Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				
					In./hr.	*In./in. of soil*	*pH*	
SM	A-2, A-4	95-100	95-100	30-40	2.0-6.3	0.13	5.1-5.5	Low.
ML, CL	A-4, A-6	95-100	95-100	50-60	0.63-2.0	.15	5.1-5.5	Moderate.
SM	A-2	90-100	90-100	20-35	2.0-6.3	.10	5.1-5.5	Low.
ML-CL, CL	A-7, A-6	95-100	95-100	50-70	0.63-2.0	.12	5.1-5.5	Moderate.
SM	A-2	90-100	90-100	10-20	>6.3	.06	4.5-6.0	Low.
SM, SP-SM	A-2	90-100	85-100	5-15	>6.3	.05	4.5-6.0	Low.
SM	A-2	95-100	95-100	25-35	2.0-6.3	.12	4.5-5.0	Low.
SM, SC	A-6, A-4	95-100	95-100	36-50	0.63-2.0	.14	4.5-5.0	Moderate to low.
CL, ML, MH	A-7	95-100	95-100	55-85	0.63-2.0	.12	4.5-6.0	Moderate.
ML-CL, MH-CH	A-7, A-6	100	95-100	50-85	0.63-2.0	.14	5.1-6.0	Moderate to high.
CL, SC	A-4	95-100	95-100	45-65	2.0-6.3	.13	5.1-5.5	Low.
MH, CH, ML-CL	A-7	95-100	95-100	60-75	0.63-2.0	.15	5.1-6.0	Moderate to high.
CL, ML, ML-CL	A-6	95-100	95-100	50-60	0.63-2.0	.14	5.1-6.0	Moderate.
SM	A-2	95-100	95-100	20-35	2.0-6.3	.12	5.6-6.0	Low.
MH, ML-CL	A-6	95-100	90-100	60-75	0.63-2.0	.13	5.6-6.0	Moderate.
MH, CH	A-7	95-100	95-100	60-85	<0.20	.12	6.1-6.5	High.
MH, CH	A-7	95-100	90-100	60-75	<0.20	.13	6.1-6.5	High.
SM	A-2	95-100	90-100	20-35	2.0-6.3	.10	5.1-5.5	Low.
ML, CL, SM	A-6, A-2	90-100	90-100	30-60	0.63-2.0	.14	5.1-5.5	Moderate.
CL, CH, MH	A-7	95-100	95-100	50-65	<0.20	.12	5.1-5.5	Moderate to high.
SM	A-2, A-4	75-100	70-95	20-40	2.0-6.3	.13	4.5-5.0	Low.
SC, CL, SM	A-6, A-4	95-100	90-100	36-55	0.63-2.0	.14	4.5-5.0	Low to moderate.
CL, SM-SC	A-4, A-6	80-100	60-100	36-60	0.63-2.0	.13	4.5-5.0	Moderate.
SM	A-2	50-85	40-85	10-25	>6.2	.08	4.5-5.0	Low.
GM, SM, SM-SC	A-2	40-50	40-50	25-35	2.0-6.3	.10	4.5-5.5	Low.
SM	A-2	75-100	65-100	20-30	2.0-6.3	.12	4.5-5.0	Low.
ML, CL, ML-CL	A-6	90-100	90-100	50-75	0.63-2.0	.13	4.5-5.0	Moderate.
MH, CH, CL	A-7	95-100	90-100	55-75	0.63-2.0	.15	4.5-5.5	Moderate.
SP-SM, SM	A-2, A-3	90-100	90-100	5-15	>6.3	.06	4.5-5.5	Low.
SP-SM, SM	A-2, A-3	90-100	85-100	5-10	>6.3	05	4.5-5.5	Low.
SM, GM	A-2	40-50	40-50	25-35	>6.3	.10	4.5-5.0	Low.
SC, SM	A-2, A-4	50-60	50-60	25-40	>6.3	.12	4.5-5.0	Moderate.
SM, GM	A-2, A-4	45-95	40-80	10-45	2.0-6.3	.10	4.5-5.0	Low.
CL, ML, ML-CL, SM	A-6	85-100	75-95	40-55	0.63-2.0	.14	4.5-5.5	Moderate.
MH, ML, CL, SM-SC	A-7, A-6	90-100	75-100	40-75	0.63-2.0	.13	4.5-5.5	Moderate.
SC, SM	A-2, A-4	40-50	40-50	25-40	0.63-2.0	.10	4.5-5.5	Moderate.
SM	A-2	95-100	95-100	25-35	2.0-6.3	.14	5.1-5.5	Low.
SC, CL	A-6, A-7	95-100	90-100	40-60	2.0-6.3	.14	5.1-5.5	Moderate.
MH, CL	A-7, A-6	95-100	95-100	60-85	2.0-6.3	.13	5.1-5.5	Moderate.

TABLE 5. *Estimated*

Soil series and map symbol	Depth to bedrock	Depth to seasonal high water table	Depth from surface	Classification
				USDA texture
Wehadkee: Wed, Weh	*Feet* 10	*Inches* 0–24	*Inches* 0–13	Silty clay loam
			13–18	Loam
			18–52	Sandy clay loam
Wickham: WsB, WsC	10	60	0–12	Gravelly sandy loam
			12–22	Sandy clay loam
			22–30	Clay loam
			30–48	Sandy clay loam
Wilkes: WEC, WEE Mapped only with Enon soils.	1½	48	0–2	Fine sandy loam
			2–18	Sandy clay loam
			18–36	Weathered rock.

[1] Alluvial land is strongly acid and has low shrink-swell potential.

TABLE 6.—*Engineering*

[No interpretations are given for Gullied land and Rock land,

Soil series and map symbol	Suitability as source of road fill	Soil features affecting—		
		Highway location	Dikes or levees	Farm ponds
				Reservoir areas
Alluvial land: Alm	Poor to fair	Seasonal high water table, subject to flooding.	Variable strength; moderate to rapid permeability.	Moderate to rapid permeability.
Altavista: AfB	Fair	Seasonal high water table.	Moderate permeability	Soil features favorable
Appling: AmB, AmC, AnB3, AnC3.	Fair	Moderate shrink-swell potential	Moderate shrink-swell potential.	Soil features favorable; good compaction.
Buncombe: Bfs	Fair to good	Subject to flooding	Rapid permeability	Rapid permeability
Cecil: CYB2, CYC2, CYE, CYE2, CZB3, CZD3.	Fair	Slopes easily eroded in deep cuts.	Moderate shrink-swell potential.	Soil features favorable; fines sufficient to impound water.
Chewacla: Cco, Cwf For Wehadkee part of Cwf, refer to Wehadkee series.	Poor to fair	Seasonal high water table	Moderate strength and stability, high water table.	Soil features favorable
Davidson: DgB, DgC2, DgD2, DhB3, DhC3, DhE3.	Fair	Slopes easily eroded in deep cuts; moderate to high shrink-swell potential.	Moderate strength and stability; moderate to high shrink-swell potential.	Soil features favorable; fines sufficient to impound water.

properties—Continued

Classification—Continued		Percentage passing sieve—			Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No 200 (0.074 mm.)				
					In./hr.	*In./in. of soil*	*pH*	
ML–CL, MH	A–6, A–7	------	100	80–90	0. 63–2. 0	0. 13	4. 5–5. 5	Moderate.
ML	A–4	95–100	95–100	40–60	0. 63–2. 0	. 17	5. 1–5. 5	Low to moderate.
SC, CL, ML	A–4, A–6	95–100	95–100	40–60	0. 63–2. 0	. 15	5. 6–6. 0	Moderate.
SM	A–2	70–100	60–95	15–35	2. 0–6. 3	. 13	4. 5–5. 0	Low.
SC	A–4	85–100	75–100	36–45	0. 63–2. 0	. 14	5. 1–5. 5	Moderate.
SC, SM–SC	A–6, A–2	90–100	80–95	30–50	0. 63–2. 0	. 15	5. 1–5. 5	Moderate.
SC	A–6, A–2	85–100	45–80	30–50	2. 0–6. 3	. 14	4. 5–5. 0	Moderate.
SM	A–2	95–100	95–100	20–35	0. 2–6. 3	. 12	5. 1–5. 5	Low.
CL, SC, ML	A–6	95–100	95–100	40–60	0. 2–0. 63	. 14	5. 1–6. 5	High.

[2] AASHO and Unified classifications are likely to vary because surface layer contains more clay than is typical for the series.

interpretations

because the soil material in those land types is too variable]

Soil features affecting—Continued				
Farm ponds Continued	Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Embankments				
Variable strength and stability; moderate to rapid permeability.	Soil features generally favorable.	Soil features favorable----	Soil features generally favorable for diversions, terraces not needed.	Soil features favorable.
Moderate strength and stability.	Not needed; moderately good drainage.	Moderate permeability---	Soil features favorable---	Soil features favorable.
Moderate strength and stability.	Not needed; good drainage.	Generally slow intake in severely eroded areas; features favorable in other areas.	Soil features favorable on slopes less than 10 percent.	Soils moderately erodible.
Rapid permeability---	Not needed; excessive drainage.	Low available water capacity.	Soil features generally favorable for diversions, terraces not needed.	Soil features favorable.
Moderate strength and stability; slow permeability if compacted.	Not needed; good drainage.	Slow intake in severely eroded areas; rapid runoff on steep slopes.	Soil features favorable on slopes less than 10 percent.	Moderately erodible soils.
Moderate strength and stability.	Surface and subsurface drainage needed, fairly shallow to water table	Seasonal high water table.	Not needed; soil nearly level.	Seasonal high water table.
Moderate strength and stability; moderate to high shrink-swell potential.	Not needed; good drainage.	Slow intake in severely eroded areas; rapid runoff on steep slopes, soil features favorable in other areas.	Soil features favorable on slopes less than 10 percent.	Moderately erodible soils.

TABLE 6. —*Engineering*

Soil series and map symbol	Suitability as source of road fill	Soil features affecting—		
		Highway location	Dikes or levees	Farm ponds
				Reservoir areas
Helena: HYB	Poor	Moderate to high shrink-swell potential.	Moderate to high shrink-swell potential.	Soil features favorable; fines sufficient to impound water.
Holston: HVB, HVD	Good	Soil features generally favorable.	Moderate strength and stability.	Soil features favorable
Enon Mapped only with Wilkes soils.	Poor	High shrink-swell potential.	High shrink-swell potential.	Soil features favorable
Louisburg: LmD	Fair	Rock at a depth of 2 to 3 feet, coarse fragments.	Moderate strength and stability, seepage; coarse fragments.	Rapid permeability; seepage.
Madison: MgB2, MgC2, MgD2, MgE, MrB3, MrD3.	Poor to fair	Moderate strength and stability.	Moderate strength and stability.	Soil features favorable; fines sufficient to impound water
Molena: MtC	Good	Subject to gully erosion	Rapid permeability; seepage.	Rapid permeability; seepage.
Mountainburg: MHF	Poor	Shallowness to rock	Shallowness to rock	Rapid permeability
Pacolet: PkB, PkC, PmB, PmD	Fair	Soil features generally favorable but shallowness to rock in places.	Moderate strength and stability.	Moderately rapid permeability, seepage at a depth of 5 feet.
Starr soils: Sto	Fair	Moderate shrink-swell potential.	Moderate strength and stability.	Moderately rapid permeability.
Wehadkee: Weа, Weh	Poor	High water table; subject to flooding; moderate shrink swell potential.	Low strength and stability; moderate shrink-swell potential.	Soil features favorable, low seepage.
Wickham: WsB, WsC	Good	Slopes easily eroded in deep cuts.	Moderate shrink-swell potential; good compaction.	Soil features generally favorable but seepage likely in places.
Wilkes: WEC, WEE For Enon part of WEC and WEE, see Enon series.	Poor	Shallowness to rock	Variable strength and stability; shallowness to rock.	Shallowness to rock; seepage probable in places.

interpretations—Continued

Soil features affecting—Continued				
Farm ponds—Continued	Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Embankments				
Moderate to high shrink-swell potential.	Slow permeability	Slow infiltration and permeability.	Erodible surface layer; clayey material below this layer.	Moderately erodible soils.
Moderate strength and stability.	Not needed, good drainage.	Soil features favorable	Soil features favorable	Soil features favorable.
High shrink-swell potential.	Not needed; good drainage.	Slow permeability	Clayey material below the surface layer.	Clayey material below surface layer.
Rock at a depth of 2 to 3 feet; coarse fragments; seepage	Not needed; well drained to excessively drained.	Low available water capacity; slopes steep in most places.	Rock at a depth of 2 to 3 feet; steep slopes in places	Rock at a depth of 2 to 3 feet; moderate erosion hazard.
Moderate strength and stability.	Not needed; good drainage.	Slow intake in severely eroded areas; rapid runoff on steep slopes.	Soil features favorable on slopes less than 10 percent.	Moderate erosion hazard.
Moderate strength and stability, rapid permeability	Not needed; somewhat excessive drainage.	Low available water capacity; rapid permeability.	Soil features favorable	Risk of gully erosion.
Shallowness over rock; coarse fragments.	Not needed; good drainage.	Low available water capacity; steep slopes.	Shallowness over rock; coarse fragments.	Shallowness over rock.
Soil features generally favorable.	Not needed; good drainage.	Medium available water capacity; crops grow well.	Soil features favorable on slopes less than 10 percent.	Except for stony profile in places, soil features favorable.
Moderate strength and stability.	Not needed; good drainage.	Soil features favorable; crops grow well.	Soil features favorable for diversions but terraces not needed.	Soil features favorable
Low strength and stability; dam may be damaged by floodwater.	High water table too wet for most cultivated crops.	Poor drainage; slow intake	Soil features favorable for diversions but terraces not needed.	Poor drainage; high water table.
Moderate strength and stability; moderately slow permeability if compacted.	Not needed; good drainage	Moderate intake; crop growth good.	Soil features favorable; soil friable and easily shaped	Moderate erosion hazard
Shallowness over rock.	Not needed; good drainage.	Production potential ordinarily too low for cultivated crops.	Shallowness over rock	Shallowness over rock.

however, that these interpretations may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and excavations deeper than the depth of layers here reported.

Some of the terms used by soil scientists have a special meaning in soil science and may not be familiar to engineers. These terms are defined in the Glossary.

Engineering classification systems

Most highway engineers classify soils in accordance with the classification by the American Association of State Highway Officials (*1*). In this system soil material is classified in seven principal groups. The groups range from A–1 (gravelly soils of high bearing capacity, the best soils for subgrade) to A–7 (clayey soils having low strength when wet, the poorest soils for subgrade). Within each group the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 for the best material to 20 for the poorest. The group index number is shown in parentheses after the soil group symbol in table 4.

Some engineers prefer to use the Unified soil classification system (*11*). In this system soil material is identified as coarse grained (eight classes), fine grained (six classes), and highly organic (one class). The last column of table 4 gives the classification of the tested soils of the three counties, according to the Unified system.

Soil scientists use the USDA textural classification. In this, the texture of the soil is determined according to the proportion of soil particles smaller than 2 millimeters in diameter; that is, the proportion of sand, silt, and clay.

Engineering test data

Soil samples from 18 soil profiles representing seven series were tested in accordance with standard procedures to help evaluate the soils for engineering purposes. The results are shown in table 4. The samples for each series were from different locations and were taken at a depth of 72 inches or less. The data therefore may not be adequate for estimating the properties of soils in deeper cuts. The samples were tested for moisture-density relationships, volume change, grain-size distribution, liquid limit, and plasticity index.

In the *moisture-density*, or compaction, test a sample of the soil material is compacted several times under a constant compactive effort, each time at a successively higher moisture content. The density of the compacted material increases as the moisture content increases until the optimum moisture content is reached. After that the density decreases with increase in moisture content. The highest density obtained in the compaction test is termed "maximum dry density." Moisture-density data are important in construction, for as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

The *volume changes* listed in table 4 indicate the amount of shrinkage and swelling in samples prepared at optimum moisture content and then subjected to drying and wetting. The sum of these two values gives the total volume change that can occur in a particular soil.

The results of the *mechanical analysis*, obtained by combined sieve and hydrometer methods, may be used to determine the relative proportions of the different size particles that make up the soil sample. The percentage of fine-grained material, obtained by the hydrometer method, which generally is used by engineers, should not be used in determining textural classes of soils.

The tests to determine liquid limit and plastic limit measure the effect of water on consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The *plastic limit* is the moisture content at which the soil material passes from a semisolid to a plastic state. The *liquid limit* is the moisture content at which the soil material passes from a plastic to a liquid state. The *plasticity index* is the numerical difference between liquid limit and plastic limit. It indicates the range in moisture content within which a soil material is in a plastic condition.

Estimated properties of soils

Estimates of soil properties that are significant in engineering are given in table 5. The estimates are based partly on test data and on field observations, and partly on experience with soils in the survey area or with similar soils in adjoining counties. They are reasonable estimates but should not replace field tests. Because the estimates are based on more than one sample, some variation from the recorded values can be expected.

The figures showing depth from the surface in table 5 are generally those given in the profile described for the series in the section "Descriptions of the Soils."

In the column showing permeability are estimates of the rate at which water moves downward through undisturbed soil material. The estimates are based on undisturbed cores of saturated soils.

Available water capacity, in inches per inch of soil depth, is the approximate amount of water in soils when wet to field capacity, minus the amount at the permanent wilting point of plants.

Reaction refers to the degree of acidity or alkalinity of a soil, expressed as a range in pH values. A pH notation of 7.0 is neutral; a higher value indicates alkalinity; and a lower one, acidity.

The ratings for shrink-swell potential indicate the volume change resulting from the shrinking of the soil when it dries and the swelling of the soil as it takes up moisture. The shrink-swell potential is estimated on the basis of the amount and type of clay in the soil layers. In general, soils classified as A–7 and CH have high shrink-swell potential. Clean sands and gravels and soils having a small amount of nonplastic to slightly plastic fines have low shrink-swell potential.

Engineering interpretations

Table 6 rates the suitability of the soils of the survey area as a source of road fill and gives features that affect work on highways and on structures that conserve soil and water. Such features generally are not apparent to the engineer unless he has access to the results of a field investigation. They are, however, significant in the construction of structures.

Suitability of the soils as a source of sand and gravel is not shown in the table. The source of sand within the survey area is somewhat limited; however, the many rocks that are in the area are possible sources of dense rock products of high quality.

Suitability of the soil material for road fill depends largely on soil texture, plasticity, moisture content, and compaction characteristics. The hazard of erosion and presence of rock within the normal depth of the road cut also are important. Highly plastic soil material that has a high content of water generally is unsuitable for road fill. The same features that apply to road fill generally apply to highway location, but also considered are the seasonal high water table and the flooding hazard.

Soil features considered in constructing dikes and levees are depth to rock, permeability, stability, and shrink-swell potential. Investigating the underlying material for permeability and seepage is an important consideration in selecting a site for a reservoir or a farm pond. The rock formations underlying the soils in the area are such that a fairly water-tight embankment can be had by cutting a core trench into weathered rock and by backfilling it with impervious material. The alluvium over the bedrock is deep enough to make this practice economically feasible.

Features to be considered in rating material for embankments for farm ponds are the strength and stability of the soil and its permeability when compacted. A thorough investigation of the site is necessary so that the soils available in the area can be used effectively and the structure can be made stable and impervious.

Lack of suitable outlets is the most limiting factor affecting agricultural drainage in the survey area.

Low available water capacity and slow infiltration and permeability are features that adversely affect soils used for irrigation purposes. Irrigation, however, is not a common practice in the survey area.

Some difficulties encountered in constructing terraces, diversions, and waterways are caused by a thick surface layer, a shallow root zone, steep slopes, and erodibility. Other adverse features are slow infiltration and permeability and poor tilth in certain plastic soils if they are wet.

Use of the Soils as Woodland[4]

The information in the following pages is based on data gathered in the field by teams of foresters and soil scientists and by representatives of Federal and State agencies and others. The interpretations will help woodland owners and managers make better use of this soil survey in establishing and harvesting trees (*5*).

The virgin forest of the three counties covered about 95 percent of the total acreage, and the rivers and streams made up the rest. About 70 percent of the total acreage now is in forest. The principal trees that grow on the better drained soils of ridges are loblolly pine (fig. 9), shortleaf pine, yellow-poplar, red oak, and white oak. The trees growing in the depressions and along drainageways are blackgum, sweetgum, water oak, willow oak, sycamore, red maple, elm, and birch.

[4] W. P. Thompson, forester, Soil Conservation Service, assisted in preparing this section.

Woodland Suitability Groups

The soils of Lamar, Pike, and Upson Counties have been placed in 13 woodland suitability groups. Each group consists of soils that generally are suited to the same kinds of trees, that need similar management, and that have about the same potential productivity. The factors considered in placing each soil in a woodland group include potential productivity, expressed as site class; species suitable for planting; and hazards and limitations related to soils.

In table 7, for each woodland suitability group, hazards and limitations are rated, site classes from principal trees are given, and species suitable for planting are listed. These interpretations are based on pertinent research, measurements by foresters and soil scientists, and the experience of woodland managers (*7*). To identify the soils in each group, refer to the "Guide to Mapping Units" at the back of this survey. Rock land and Gullied land have not been placed in woodland groups because trees suitable for commercial use do not grow on them. For more information about the soils in each group, refer to the section "Descriptions of the Soils."

Each woodland group is identified by a three-part symbol. The first part of the symbol is a numeral that indicates the relative potential productivity of the soils in the group; 1 means very high; 2, high; 3, moderately high; and 4, moderate. These ratings are based on field determinations of average site classes.

The second part of the symbol identifying a woodland group is a small letter. Except for the letter *o*, this letter indicates an important soil property that imposes a moderate or severe limitation that affects managing the soils of the group for trees. The letter *o* shows that the soils have few limitations that restrict their use for trees. The letter *r* shows that the main limitation is relief or slope; *s* indicates that the soil is excessively sandy; *c* indicates that the main limitation is the kind or amount of clay in the upper part of the soils; *w* means that wetness is the chief limitation; and *x* shows that stones or rock in and on the soils are the chief limiting factor. In designating soils that have more than one limitation, the most severe limiting characteristic is listed first.

The third part of the symbol is a numeral that shows the degree of limitation and the suitability of the soils for certain kinds of trees. The numeral 1 indicates the soils have no significant limitations and are well suited to needle leaved trees; 2 indicates that the soils have one or more moderate limitations and are well suited to needle-leaved trees; and 3 indicates that the soils have one or more severe limitations and are well suited to needle-leaved trees. The numeral 4 shows that the soils have no significant limitations and are well suited to broad leaved trees; 5 shows that the soils have one or more moderate limitations and are well suited to broad-leaved trees; and 6 shows that the soils have one or more severe limitations and are well suited to broad leaved trees. None of the woodland groups in the survey area has 4, 5, or 6 as the third part of the symbol identifying the group. The numeral 7 means that the soils have no significant limitations and are well suited to both needle leaved and broad-leaved trees; 8 means that the soils have one or more moderate limitations and are well suited to needle-leaved and broad-leaved trees; and 9 means that the soils have

Figure 9.—A stand of recently thinned loblolly pine on Davidson clay loam, 2 to 6 percent slopes, severely eroded.

one or more severe limitations but are suited to needleleaved and broad-leaved trees. For the survey area, the letter *e* has been used in the symbol 4c2e so as to designate severely eroded soils that have moderate to severe limitations.

Some of the terms in table 7 are discussed in the following paragraphs.

Potential productivity of the woodland suitability groups is rated very high, high, moderately high, or moderate for a given species and also is expressed as site class. Site class is the average height, in feet, shown to age 50 for all dominant and codominant species. The site class is given in table 7 for cottonwood at 30 years of age, for sycamore at 35 years of age, and at age 50 for all other species.

Ratings for equipment limitations are based on the degree that soils and topographic features restrict or prohibit use of equipment normally employed in tending crops of trees. The limitation is *slight* if there is little or no restriction on the type of equipment to be used or the time of year the equipment can be used. It is *moderate* if use of equipment is limited during wet seasons not exceeding 3 months, or if modified equipment or methods of harvesting are necessary. The limitation is *severe* if special equipment is needed or if the use of such equipment is severely restricted by one or more unfavorable soil characteristics. These unfavorable soil characteristics include seasonal wetness, slope, soil texture, and number or size of stones. Only a rating of *moderate* or *severe* is used in the survey area.

The erosion hazard refers to susceptibility to erosion where management and harvesting practices are normal. A rating of *slight* indicates that problems of erosion control are unimportant; and *moderate* indicates that some precautions are needed to prevent accelerated erosion. Constructing and maintaining roads, skid trails, and fire lanes require some special treatment. A rating of *severe* indicates that special treatment is required to minimize accelerated erosion on roads, skid trails, and fire lanes. Only a rating of *slight* or *moderate* is used in the survey area.

Seedling mortality refers to the expected degree of mortality of naturally occurring or planted seedlings, as influenced by unfavorable soil characteristics when plant competition is not a factor. Mortality is *slight* if ordinarily, the seedling survival is more than 75 percent; *moderate* if the survival is between 50 and 75 percent; and *severe* if seedling survival is less than 50 percent. Adequate restocking is not expected without additional treatment. For example, superior planting, good planting stock, and replanting may be required for adequate stands.

TABLE 7. *Woodland suitability groups of soils, site class, and species suitable for planting*

Woodland suitability groups and map symbols	Potential productivity		Species suitable for planting
	Tree species	Site class	
Group 1o7: AlM, Sto. Loamy soils on which potential productivity is very high, management hazards are not serious, and broad-leaved and needle-leaved trees are well suited.	Black walnut Cottonwood Green ash Loblolly pine Sweetgum Sycamore Water oak Yellow-poplar	100 110 90 90 100 90 90 110	Loblolly pine, cherrybark oak, cottonwood, sweetgum, sycamore, black walnut, and yellow-poplar.
Group 1w8: Cco. Seasonally wet, loamy soils on which potential productivity is very high, equipment limitations are moderate, seedling mortality is slight to moderate, and broad-leaved and needle-leaved trees are well suited.	Cottonwood Green ash Loblolly pine Red oak Sweetgum Sycamore Water oak Yellow-poplar	100 100 100 90 100 90 90 100	Cottonwood, loblolly pine, sweetgum, sycamore, yellow-poplar, and cherrybark oak.
Group 1w9: Cwf, Wed Weh Excessively wet, loamy soils on which potential productivity is very high, equipment limitations are severe, seedling mortality is moderate to severe, and broad-leaved and needle-leaved trees are well suited.	Cottonwood Green ash Loblolly pine Sweetgum Sycamore Water oak Yellow-poplar	90 100 100 90 90 90 100	Cherrybark oak, cottonwood, green ash, sweetgum, sycamore, loblolly pine, and yellow-poplar.
Group 2s8: Bfs. Sandy alluvial soils on which productivity is high, equipment limitations and seedling mortality are moderate, and broad-leaved and needle-leaved trees are suitable	Cottonwood Sycamore Sweetgum	100 90 90	Cottonwood, sycamore, loblolly pine, cherrybark oak, black walnut, and yellow-poplar.
Group 2w8: AlB. Seasonally wet, loamy soils on which productivity is high, equipment limitations are moderate, seedling mortality is slight to moderate, and broad-leaved and needle-leaved trees are well suited.	Loblolly pine Sweetgum Yellow-poplar Red oak White oak Sycamore	90 90 100 80 80 90	Loblolly pine, sweetgum, sycamore, yellow-poplar, cottonwood, and cherrybark oak.
Group 3o7: AmB, AmC, CYB2, CYC2, DgB, DgC2, DgD2, HVB, HVD MgB2, MgC2, MgD2, PmB, PmD, WsB, WsC. Soils have a loamy surface layer and loamy to clayey subsoil; productivity is moderately high, management hazards are not serious, and broad-leaved and needle-leaved trees are suitable.	Loblolly pine Red oak White oak Yellow-poplar Virginia pine	80 70–80 70–80 90 70+	Loblolly pine, yellow-poplar, white pine, and red oak.
Group 3r8: CYE, CYE2, MgE. Moderately steep soils; have a loamy surface layer and loamy to clayey subsoil; productivity is moderately high, equipment limitations and erosion hazard are moderate, and broad-leaved and needle-leaved trees are suitable.	Loblolly pine Shortleaf pine Yellow-poplar Red oak White oak Virginia pine	80 70 90 70–80 70–80 70+	Loblolly pine, yellow-poplar, northern red oak, white pine, and Virginia pine
Group 3s2: MtC. Sandy soils on which productivity is moderately high, equipment limitations and seedling mortality are moderate, and needle-leaved trees are well suited.	Loblolly pine Red oak White oak	80 80 70	Loblolly pine.
Group 3w8: HYB. Seasonally wet soils; have a loamy surface layer and mainly clayey subsoil; productivity is moderately high, equipment limitations are moderate, seedling mortality is slight to moderate, and broad-leaved and needle-leaved trees are suitable.	Loblolly pine Yellow-poplar Red oak Sweetgum White oak	80 90 70 80 70	Loblolly pine, sycamore, yellow-poplar, and sweetgum.
Group 3x3 LmD, PkB, PkC. Stony soils; chiefly have a loamy surface layer and loamy to clayey subsoil; productivity is moderately high, equipment limitations are moderate to severe, erosion hazard is slight to moderate, and needle-leaved trees are well suited.	Loblolly pine Virginia pine Red oak White oak	80 70 70 70	Loblolly pine and Virginia pine.

TABLE 7.—*Woodland suitability groups of soils, site class, and species suitable for planting*—Continued

Woodland suitability groups and map symbols	Potential productivity		Species suitable for planting
	Tree species	Site class	
Group 4o1: WEC Soils have a loamy surface layer and a loamy to clayey subsoil; productivity is moderate, management hazards are not serious, and needle-leaved trees are well suited.	Loblolly pine Shortleaf pine Virginia pine Red oak White oak Yellow-poplar	70 60 60 70 70 80	Loblolly pine, eastern redcedar, and Virginia pine.
Group 4r2: MHF, WEE. Moderately steep to steep soils that have a loamy surface layer and loamy to clayey subsoil; productivity, erosion hazard, and equipment limitations are moderate, and needle-leaved trees are well suited.	Loblolly pine Shortleaf pine Virginia pine Red oak White oak	70 60 60 70 70	Loblolly pine, Virginia pine, and eastern redcedar.
Group 4c2e: AnB3, AnC3, CZB3, CZD3, DnB3, DhC3, DhE3, MiB3, MiD3. Severely eroded soils that mainly have a clayey subsoil; productivity is moderate, erosion hazard and equipment limitations are moderate, seedling mortality is slight to moderate, and needle-leaved trees are suitable.	Loblolly pine Virginia pine Shortleaf pine Red oak White oak	70 60 60 70 60	Loblolly pine and Virginia pine.

Species suitability is shown by naming the principal commercial species suitable for planting. The selection of preferred species is influenced by the growth rate and by the quality, value, and marketability of the products obtained from each species.

Use of the Soils for Wildlife[5]

Successful management of wildlife requires that food, cover, and water be available in a suitable combination. The lack of any one of these necessities may severely limit the numbers of wildlife or account for the absence of wildlife species. Information on soils is a valuable tool in creating or improving suitable habitat. Most wildlife habitat can be managed by planting suitable vegetation and by managing existing vegetation so as to bring about natural establishment and to increase the growth of choice plants. Water areas can be created, or natural ones can be improved.

Table 8 gives the suitability of all the soils in the survey area for elements of wildlife habitat and kinds of wildlife. Elevation, aspect, and other factors of the landscape that influence habitat were not considered in the ratings listed in table 8. All of these must be appraised onsite.

The suitability ratings shown in table 8 are defined as follows.

Well suited, indicated by numeral 1, means that only low intensity management is needed in creating or improving habitat, and satisfactory results are assured.

Suited, indicated by numeral 2, means that moderate intensity management is needed for satisfactory results.

Poorly suited, indicated by numeral 3, means that creating or improving habitat is difficult and intensive effort is needed to maintain it.

Unsuited, indicated by numeral 4, means that managing the habitat is highly impractical, if not impossible.

Special attention is needed in rating woodland habitat of coniferous woody plants. There is considerable evidence that if growth is slow and canopy closure is delayed coniferous habitat harbors larger numbers and kinds of wildlife than if growth is rapid. Soil properties, therefore, that tend to promote rapid growth and canopy closure are actually limitations. In general, the same properties that are favorable for the quick establishment and rapid growth of conifers are also favorable for the establishment of hardwoods. Consequently, serious competition occurs between the two species.

The wildlife habitat elements shown in table 8 are defined in the following paragraphs.

GRAIN AND SEED CROPS: Agricultural grain or seed-producing annuals planted to produce food for wildlife. Examples are corn, sorghum, wheat, oats, millet, soybeans, and proso.

GRASSES AND LEGUMES: Domestic perennial grasses and herbaceous legumes that are established by planting and that furnish wildlife food and cover. Examples are fescue, bromegrass, lovegrass, orchardgrass, reed canarygrass, panicgrass, bahia, white clover, trefoil, alfalfa, and annual lespedeza, perennial lespedeza, and shrub lespedeza.

WILD HERBACEOUS UPLAND PLANTS: Native or introduced perennial grasses and forbs (weeds) that provide food and cover principally to upland forms of wildlife, and that are established mainly through natural processes. Examples are bluestem, wild ryegrass, oatgrass, pokeweed, strawberries, lespedeza, beggarweed, wild beans, nightshade, goldenrod, dandelions, cheat, poorjoe, and ragweed.

HARDWOOD WOODY PLANTS: Nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, twigs (browse) or foliage used extensively as food by wildlife, and that commonly are established through na-

[5] PAUL D. SCHUMACHER, biologist, Soil Conservation Service, helped prepare this section.

TABLE 8.—*Suitability for elements of wildlife habitat and kinds of wildlife*

[1 means well suited, 2 means suited, 3 means poorly suited, 4 means unsuited See text for further explanation of ratings]

Soil and map symbol	Elements of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Ponds	Openland	Woodland	Wetland
Alluvial land: Alm	2	1	2	1	3	2	3	3	2	3	3
Altavista: AlB	2	1	2	1	3	2	3	2	1	1	3
Appling:											
AmB	1	1	1	2	3	4	3	1	1	2	4
AmC	2	2	1	2	3	4	4	2	2	2	4
AnB3	3	3	2	3	2	4	4	3	3	3	4
AnC3	4	4	3	3	2	4	4	4	4	3	4
Buncombe: Bfs	4	3	3	4	1	4	4	4	3	3	4
Cecil:											
CYB2	1	1	1	2	3	4	3	1	1	2	4
CYC2	2	1	2	2	3	4	4	1	2	2	4
CYE	4	3	3	2	3	4	4	3	4	2	4
CYE2	4	3	3	2	3	4	4	3	4	2	4
CZB3	3	3	3	3	2	4	4	3	3	3	4
CZD3	4	3	3	3	2	4	4	4	4	3	4
Chewacla complex: Coc	2	2	1	1	2	2	3	3	2	1	2
Chewacla and Wehadkee: Cwf	3	3	4	1	1	1	2	3	3	1	1
Davidson:											
DgB	1	1	1	2	3	4	4	3	1	2	4
DgC2	2	1	2	2	3	4	4	3	2	3	4
DgD2	4	2	2	2	3	4	4	3	3	3	4
DhB3	3	3	3	3	2	4	4	3	3	3	4
DhC3	4	3	3	3	2	4	4	3	4	3	4
DhE3	4	4	4	3	2	4	4	4	4	2	4
Gullied land: Gul	4	4	4	4	2	4	4	4	4	2	4
Helena: HYB	2	2	3	2	3	4	3	4	2	2	4
Holston:											
HVB	2	1	2	2	3	4	3	1	1	2	4
HVD	3	2	3	2	3	4	4	3	3	2	4
Louisburg: LmD	4	4	4	3	3	4	4	4	4	3	4
Madison:											
MgB2	1	1	1	2	3	4	3	1	1	2	4
MgC2	2	1	2	2	3	4	4	1	2	2	4
MgD2	3	2	3	2	3	4	4	4	3	2	4
MgE	4	2	2	2	3	4	4	4	4	2	4
MrB3	3	3	3	3	2	4	4	3	3	3	4
MrD3	4	4	4	4	2	4	4	4	4	3	4
Molena: MtC	2	2	2	2	3	4	4	4	2	2	4
Mountainburg: MHF	4	4	3	2	3	4	4	4	4	3	4
Pacolet:											
PkB	2	2	2	2	3	4	4	2	3	2	4
PkC	3	2	3	2	2	4	4	3	3	2	4
PmB	2	2	3	2	3	4	4	3	2	2	4
PmD	3	3	3	3	2	4	4	4	3	2	4
Rock land. Roc	4	4	3	4	1	4	4	4	4	4	4

TABLE 8.—*Suitability for elements of wildlife habitat and kinds of wildlife*—Continued

Soil and map symbol	Elements of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Ponds	Openland	Woodland	Wetland
Starr: Sto	1	1	1	2	3	4	3	2	1	2	3
Wedhadkee:											
Wed	4	4	4	1	4	1	1	1	3	1	1
Weh	4	3	4	1	4	1	1	1	3	1	1
Wickham:											
WsB	1	1	2	2	3	4	3	1	1	2	4
WsC	2	2	2	2	3	4	4	3	2	2	4
Wilkes and Enon:											
WEC	3	2	2	3	2	4	4	4	3	2	4
WEE	4	3	3	3	2	4	4	4	4	2	4

tural processes but also may be planted. Examples are oak, beech, cherry, hawthorn, dogwood, viburnum, maple, birch, poplar, grapes, honeysuckle, blueberry, briers, greenbriers, autumn olive, and multiflora rose.

CONIFEROUS WOODY PLANTS: Cone-bearing trees and shrubs that are important to wildlife mainly as cover but that also furnish food in the form of browse, seeds, or fruitlike cones; plants commonly are established through natural processes but also may be planted. Examples are pine and redcedar.

WETLAND FOOD AND COVER PLANTS: Annual and perennial, wild herbaceous plants in moist to wet sites, exclusive of submerged or floating aquatics, that produce food or cover extensively and that are dominantly used by wetland forms of wildlife. Examples are smartweed, wild millet, bulrush, spike sedge, rushes, sedges, burreeds, wild rice, rice cutgrass, mannagrass, and cattails.

SHALLOW WATER DEVELOPMENTS: Impoundments or excavations for control of water, generally not exceeding 6 feet in depth. Examples are low dikes and levees; shallow dugouts; level ditches; devices for water level control in marshy drainageways, or channels.

PONDS: Dug-out water areas or combinations of dug-out areas and low dikes (dammed areas) that have water of suitable quality, of suitable depth, and in ample supply for production of fish or wildlife. Examples are ponds built on nearly level land, of at least one-fourth acre surface area, having an average depth of 6 feet in at least one-fourth of the area, and having a dependably high water table or other source of water.

As shown in table 8, there are three classes of wildlife. *Open wildlife:* quail, doves, meadowlark, field sparrow, cottontail rabbit and fox, and other birds and mammals that normally live on cropland, pasture, meadow, lawn, and in other openland areas where grasses, herbs, and shrubby plants grow. *Woodland wildlife:* woodcock, thrush, vireo, wild turkey, squirrel, deer, raccoon, and other birds and mammals that normally live in wooded areas where hardwood trees and shrubs and coniferous trees grow. *Wetland wildlife:* ducks, geese, rails, herons, shore birds, mink, and other birds and mammals that normally live in marshes, swamps, and other wet areas.

Practical help in planning and establishing habitat for wildlife or fish can be obtained from the work unit conservationist of the Soil Conservation Service.

Formation and Classification of the Soils

This section describes the major factors of soil formation and tells how these factors have affected the soils of the three counties. It also defines the current system for classifying soils and shows the classification by series and higher categories.

Formation of Soils

Soil forms through the interaction of five soil-forming factors—parent material, climate, relief, and plants and animals, over a period of time. These factors, including time, determine the characteristics of any soil that forms at any point on the earth. All of these factors affect the formation of each soil, but the relative importance of each factor differs from place to place. In some areas one factor may dominate in the formation of a soil and determine most of its properties, as is common where the parent material consists of pure quartz sand. Quartz sand is highly resistant to weathering, and soils formed in it generally have faint horizons. Even in quartz sand, however, a distinct profile can be formed under certain types of vegetation if the relief is low and flat and if the water table is high. The five factors of soil formation are discussed in the following paragraphs.

Parent material

Parent material is the unconsolidated mass from which a soil develops. It is largely responsible for the chemical and mineralogical composition of soils. Most of the soils in the survey area formed from residual material; that is, material weathered from the underlying rock.

According to the Geologic Map of Georgia (*2*), about 84 percent of the three counties is underlain by augen gneiss, biotite gneiss and schist, biotite and muscovite granite, and granite gneiss. In most places the residual soils derived from these rocks are in the Appling, Cecil, Davidson, and Madison series. The clay minerals in these soils are kaolinitic.

The rest of the survey area is underlain by Manchester schist, Sparks schist, and quartzite (sandstone). The principal soils weathered from these rocks are in the Mountainburg and Pacolet series. Coarse fragments are on the surface and in the profile.

The minerals in the parent material determine to a large extent the amount and kinds of clay in the soil. Louisburg soils, for example, formed in material weathered from granite. Granite is high in quartz, a mineral very resistant to weathering. These soils are therefore sandy and have faint horizons and a small amount of clay. In contrast, the Davidson soils formed in material weathered from biotite gneiss, a rock that contains more minerals less resistant to weathering than granite. These soils contain a fairly large amount of clay. The Madison soils, on the other hand, also contain an appreciable amount of clay, but the material from which they formed contains large amounts of muscovite. Muscovite resists weathering, so that a large amount of mica remains in the soil.

Climate

Climate affects the physical, chemical, and biological properties in the soil profile.

Temperature and rainfall largely determine the rate at which rocks weather and minerals decompose. They also influence leaching and transporting of minerals and organic matter through the soil. The amount of water that percolates through the soil depends on rainfall, relative humidity, soil permeability, and relief. Consequently, climate directly affects the accumulation of parent material and the processes of soil formation. The effects of climate indirectly control the kinds of plants and animals that can thrive in a region.

The climate in Lamar, Pike, and Upson Counties is of the humid, warm-temperature type that is characteristic of the southeastern part of the United States. The soils generally are moist from December through August 31, but are moderately dry from September 1 through November 30. The surface layer is frozen only a few days each year, and then only to a depth of 1 to 3 inches.

Because the climate is uniform throughout the survey area, it has not caused major local differences among the soils. It has tended rather to cause similarities, even among soils formed in different kinds of parent material. Most of the soils in the area are highly weathered, leached, strongly acid, and low in natural fertility.

Relief

Relief, or shape of the landscape, affects soil formation through its influence on drainage, erosion, plant cover, and soil temperature. Relief in the survey area is largely determined by the kind of bedrock underlying the soils, by the geology of the area, and by the dissection by streams. The relief in the three counties is gently rolling to hilly. In some places there are narrow stream valleys.

The soils of the survey area have slopes of 0 to 45 percent. Soils that have slopes of less than 15 percent are generally thicker and have more distinct horizons than the steeper soils do. If the slope is as much as 15 to 45 percent, geologic erosion removes soil material almost as fast as it is weathered. As a result, most moderately steep and steep soils have a thin root zone. Mountainburg soils are an example.

The uplands range from about 400 to 1,300 feet above sea level, and the bottom lands from 400 to 700 feet. Partly because of this range in elevation and the many branching drainageways, drainage is good in most upland areas. Excess water moves into the drainage channels rapidly and is removed quickly.

Plants and animals

Plants, animals, bacteria, and other living organisms are active in the soil-forming processes. The changes they bring about depend mainly on the kinds of life processes peculiar to each. The kinds of plants and animals that live on and in the soil are affected, in turn, by the climate, the parent material, the relief, and the age of the soil.

Most of the soils in the survey area formed under a forest cover consisting of various kinds of hardwoods and of such softwoods as pines. These plants supply most of the organic matter available to the soils; hardwoods contribute more than softwoods.

The growing plants provide a cover that helps to reduce erosion and stabilize the surface so that the soil-forming processes can continue. Leaves, twigs, and entire plants accumulate on the surface of forest soils and then decompose as the result of percolating water and of micro-organisms, earthworms, and other forms of animal life acting on the soil. The roots of plants widen cracks in the rocks and thus permit more water to enter the soil. Also, the uprooting of trees influences soil formation through mixing the soil layers and loosening the underlying material.

By mixing organic matter into the soil and by helping to break down the remains of plants, small animals, earthworms, insects, and micro-organisms also influence soil formation. Small animals burrow into the soil and thus mix the layers. Earthworms and other small invertebrates feed on the organic matter in the upper few inches of the soil. They slowly but continually mix the soil material and in places alter it chemically. Bacteria, fungi, and other micro-organisms hasten the weathering of rock minerals and the decay of organic matter.

Time

Generally, a long time is required for a soil to form (*8*). The length of time that parent material has been in place, therefore, is usually reflected in the character of the soil.

If soil material has been in place long enough, it will approach an equilibrium with its environment. Soils on old land surfaces tend to have well-defined and related horizons. Examples are the Cecil, Davidson, and Madison soils. In contrast, on young land surfaces the soils have a shallow solum, and the horizons are not well defined. Louisburg, Mountainburg, and Wilkes are examples.

The time effect on soil formation is often interrupted by water, an active agent in the removal and transportation of soil material. Soil material deposited on flood

plains has not been in place long enough for a mature soil to form. The Buncombe soils are an example. Alluvial material that has been in place for a long time tends to have distinct horizons and physical and chemical properties similar to those of the parent soil. An example is the Wickham soils.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories, so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*8*) and revised later (*6*). The system currently used by the National Cooperative Soil Survey was adopted in 1965 (*10*). It is under continual study. Readers interested in the development of the system should refer to the latest literature available (*4*).

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

In table 9 the soil series of Lamar, Pike, and Upson Counties are classified according to the family, subgroup, and order of the current system.

Following are brief descriptions of each of the categories in the current system.

Order.—Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The orders are primarily broad climatic groupings. Two exceptions are the Entisols and Histosols, which occur in many different climates. Four of the soil orders, the Entisols, Inceptisols, Alfisols, and Ultisols, are represented in Lamar, Pike, and Upson Counties.

Entisols are recent mineral soils that do not have genetic horizons or have only the beginning of such horizons.

Inceptisols are mineral soils in which genetic horizons have started to develop. They occur most commonly on young but not recent land surfaces.

Alfisols are mineral soils that have an illuvial horizon in which significant amounts of clay minerals have accumulated and in which base saturation is more than 35 percent at a depth of 50 inches below the top of the clay-enriched horizon.

Ultisols are mineral soils that have a clay-enriched B horizon that has a base saturation of less than 35 percent at a depth of 50 inches below the top of the clay-enriched horizon.

Suborder.—Each order is subdivided into suborders, primarily on the basis of soil characteristics that seem to produce classes having the greatest genetic similarity. A suborder has a narrower climatic range than an order. The criteria for suborders reflect either (1) the presence or absence of waterlogging or (2) differences in climate or vegetation.

Great Group.—Each suborder is divided into great groups on the basis of uniformity in kind and sequence of genetic horizons. The horizons considered are those in which clay, iron, or humus have accumulated or those that have pans interfering with the growth of roots or the movement of water. Among the features considered are the self-mulching properties of clay, the soil temperature, and the major differences in chemical composition, mainly calcium, magnesium, sodium, and potassium.

TABLE 9.—*Soil series classified according to the current system of classification* [1]

Series	Family	Subgroup	Order
Altavista	Fine-loamy, mixed, thermic	Aquic Hapludults	Ultisols.
Appling	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Buncombe	Mixed, thermic	Typic Udipsamments	Entisols.
Cecil	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Chewacla	Fine-loamy, mixed, thermic	Aquic Fluventic Dystrochrepts	Inceptisols.
Davidson	Clayey, kaolinitic, thermic	Rhodic Paleudults	Ultisols.
Enon	Fine, mixed, thermic	Ultic Hapludalfs	Alfisols
Helena	Clayey, mixed, thermic	Aquic Hapludults	Ultisols
Holston	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Louisburg	Coarse-loamy, mixed, thermic	Ruptic-Ultic Dystrochrepts	Inceptsiols
Madison	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Molena	Sandy, mixed, thermic	Psammentic Hapludults	Ultisols.
Mountainburg	Loamy-skeletal, siliceous, thermic	Lithic Hapludults	Ultisols.
Pacolet	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Starr	Fine-loamy, mixed, thermic	Fluventic Dystrochrepts	Inceptisols.
Wehadkee	Fine-loamy, mixed, nonacid, thermic	Typic Fluvaquents	Entisols.
Wickham	Fine-loamy, mixed, thermic	Typic Hapludults	Ultisols.
Wilkes	Loamy, mixed, thermic, shallow	Typic Hapludalfs	Alfisols

[1] Placement of some soil series in the current system of classification, particularly in families, may change as more information becomes available

Subgroup.—Each great group is divided into subgroups, one representing the central (typic) segment of the group, and others, called intergrades, that have mostly the properties of one great group and also one or more properties of another great group, suborder, or order.

Family.—Families are established within each subgroup primarily on the basis of properties important to the growth of plants or the behavior of soils if they are used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

Series.—The series has the narrowest range of characteristics of the classes in the classification system. It is explained in the section "How This Survey Was Made." A detailed description of each soil series in the county is given in the section "Descriptions of the Soils."

Additional Facts About the Counties

This section discusses the population and provides information about physiography and drainage, farming, climate, water supply, transportation and utilities, and industries in Lamar, Pike, and Upson Counties. The statistics under the heading "Farming" are from the 1964 Census of Agriculture.

Population

Lamar County was formed in 1820, and settlement was well underway by 1822. According to the U.S. Census of Agriculture, the population was 9,745 in 1930; 10,242 in 1950; and 10,240 in 1960. Although the total population remained about the same from 1950 to 1960, the farm population decreased from 15 to 20 percent. Barnesville, the county seat, is near the center of the county.

Pike County was formed in 1820; settlement was well underway by 1821. The population was 10,853 in 1920; 8,459 in 1950; and 7,138 in 1960. Although the total population decreased 16 percent from 1950 to 1960, the farm population decreased about 30 percent. Zebulon, the county seat, is near the center of the county.

Upson County was formed in 1824. Settlement was well underway by 1825. The population was 19,509 in 1930; 25,078 in 1950; and 23,800 in 1960. The total population decreased 5 percent from 1950 to 1960, but the total farm population decreased about 25 percent. Thomaston, the county seat, is near the center of the county.

Physiography and Drainage

The survey area is in the west-central part of Georgia and in the Southern Piedmont Major Land Resource Area. The elevation is about 500 feet near the Taylor County line, but ranges from 750 to about 1,300 feet on the ridgetops. The area is made up of broad, convex ridgetops dissected by many drainageways. Slopes are very gently sloping to strongly sloping, except near the major streams and on Pine Mountain, where they are long and steep. The area has been subject to geologic erosion for a long time, and the underlying igneous and metamorphic rocks generally are deeply weathered.

The eastern part of Lamar County and the northeastern corner of Upson County are drained by the Little Towaliga River and Tobesofkee Creek. These streams flow in an easterly direction. The rest of the area is drained by the Flint River and its tributaries—Birch, Elkins, Potato, and Swift Creeks. This drainage system generally flows in a southerly direction.

Farming

The economy of the three counties has declined steadily in the past 20 years. The most drastic change has been during the period 1950 to 1960; the number of commercial farms decreased nearly 50 percent, and the number of family-operated farms decreased about 60 percent. The percentage of the total labor force actually engaged in farming decreased from nearly 50 percent in 1940 to about 10 percent in 1960.

Between 1950 and 1960, the acreage of cropland harvested decreased by about 55 percent. The acreage pastured, however, increased by about 35 percent, and the acreage in woodland increased by about 15 percent.

The important farm products in the area are livestock and related products, cotton, peaches, corn, poultry, small grains, truck crops, soybeans, and hay.

Table 10 gives the acreages of the main crops and numbers of peach trees in 1964 in the three counties. Table 11 lists the numbers of livestock and poultry on farms in 1964.

TABLE 10.—*Acreages of principal crops and numbers of peach trees on farms in Lamar, Pike, and Upson Counties*

Crop	Lamar County	Pike County	Upson County
	Acres	*Acres*	*Acres*
Corn for all purposes	1, 813	3, 143	1, 643
Cotton	1, 564	4, 959	260
Wheat	194	595	119
Oats harvested for grain	410	377	198
Land from which hay was cut	2, 172	3, 184	2, 755
	Number	*Number*	*Number*
Peach trees of bearing age	22, 483	44, 836	59, 777

TABLE 11.—*Livestock on farms in 1964 in Lamar, Pike, and Upson Counties*

Livestock	Lamar County	Pike County	Upson County
	Number	*Number*	*Number*
Cattle and calves	7, 316	9, 009	8, 415
Hogs and pigs	883	748	536
Sheep and lambs	91	29	24
Chickens, 4 months old and over	12, 760	114, 177	95, 588

Climate [6]

Lamar, Pike, and Upson Counties are on the Piedmont Plateau. Most of the area is above 750 feet, but elevations range from about 400 to 1,300 feet. The elevation

[6] By HORACE S. CARTER, State climatologist, U.S. Weather Bureau, Athens, Ga.

409-416—72——5

TABLE 12.—*Temperature and precipitation*

Month	Temperature				Precipitation		
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—	
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—
	°F	°F	°F.	°F.	Inches	Inches	Inches
January	58. 2	35. 9	74	19	4. 67	1. 8	8. 4
February	61. 6	37. 4	76	21	4. 98	1. 9	8. 6
March	67. 8	42. 1	82	25	6. 52	3. 0	10. 5
April	76. 6	49. 8	87	36	5. 05	1. 8	9. 3
May	83. 9	58. 6	93	48	3. 36	1. 1	5. 6
June	88. 9	65. 6	97	58	4. 08	2. 1	6. 0
July	89. 6	68. 2	97	63	5. 54	2. 8	9. 5
August	90. 0	68. 0	97	62	3. 34	1. 0	6. 5
September	85. 3	63. 5	95	53	3. 41	. 5	7. 3
October	76. 9	52. 6	88	38	2. 09	. 2	6. 3
November	66. 7	41. 9	80	27	3. 05	. 7	8. 4
December	58. 6	35. 5	73	20	3. 76	2. 1	7. 8
Year	75. 4	51. 6	[1] 99	[1] 16	49. 85	41. 9	64. 1

[1] The extreme in temperature that will be equaled or exceeded on at least 4 days in 2 years out of 10.

is highest along the eastern extension of Pine Mountain, which runs from east to northeast across the counties. The climate is influenced by the local elevation and variations in terrain, by the Gulf of Mexico over 200 miles to the south, and by the southern extremity of the Appalachian Mountains. Data on temperature and precipitation are given in table 12.

During the warm season, southerly winds are predominant; for this reason, the summers are moderately warm and humid. Extreme temperatures, however, are somewhat moderate in the higher areas. The minimum temperature in early morning is usually in the 60's but averages about 68° F. in summer. The maximum temperature in the afternoon reaches or exceeds 90° on about 60 days during an average summer.

The cold fronts move through the area at fairly regular intervals from late November to March, but they generally last only a few days and are followed by long periods of mild weather. On about 40 days per winter, the minimum temperature drops to 32°. Readings of 20° or lower are usually recorded four or five times during each winter, but occasionally, a reading of near zero can be expected. Except during cold spells, the weather is comfortable by midafternoon. The average high temperature in winter is just under 60°.

The average length of the growing season is 225 to 230 days. The rolling to hilly terrain over much of the area results in considerable local variation in minimum temperatures and length of the growing season. Freezing temperatures usually occur later in spring and earlier in fall in the valleys and low areas than on the more exposed hills. Probabilities of freezing temperatures in spring and fall for specified dates are given in table 13.

The precipitation averages nearly 50 inches per year. The average monthly rainfall increases gradually through winter and early in spring to 6½ inches in March. Following a decrease late in spring, a secondary peak is reached in July. Fall is the driest season, and October, the driest month; the precipitation averages just a little more than 2 inches. Periods of dry weather have occurred during most years, but they usually are more frequent in fall. The total annual rainfall was more than 40 inches nearly 90 percent of the time during a 53 year period recorded by the weather station at Concord. It was less than 35 inches in only 2 years.

Little snow falls in the area, although flurries may occur at the higher elevations. Measurable amounts are recorded about 1 year in 5. Six inches was recorded at

TABLE 13. *Probabilities of last freezing temperatures in spring and first in fall*

Probability	Dates for given probability at temperature of—		
	24° F. or lower	28° F. or lower	32° F. or lower
Spring:			
1 year in 10 later than.	March 21	March 29	April 11.
2 years in 10 later than.	March 11	March 22	April 6.
5 years in 10 later than.	February 23	March 13	March 27.
Fall:			
1 year in 10 earlier than.	November 15	November 5	October 25.
2 years in 10 earlier than.	November 24	November 10	October 28.
5 years in 10 earlier than.	December 7	November 22	November 7.

Concord in January 1940. The average relative humidity is 80 to 90 percent in early morning and 50 to 60 percent in early afternoon.

Water Supply

The water supply is adequate for industrial and farm use. The cities and towns use water from streams, reservoirs, and drilled wells. Elkins Creek supplies water for the town of Zebulon, and Potato Creek supplies water for Thomaston.

Water for domestic use on most farms comes from dug wells that are about 30 to 75 feet deep and from drilled wells that are about 100 to 250 feet deep. These wells generally are a dependable source of water throughout the year. The large streams, branches, creeks, and more than 681 farm ponds in the three counties are the main sources of water for livestock. These streams and ponds also are suitable for production of fish, and they furnish recreation.

Transportation and Utilities

There are 1,306 miles of roads in the three counties, of which 400 miles are paved. U.S. Highway No. 19 crosses the central part of Pike and Upson Counties, and U.S. Highway No. 41 crosses northwest to southeast through Lamar County. The two major railroads that serve the area have branch lines extending to most communities. Eight motor freight lines serve the area. Scheduled bus transportation is available.

The larger towns have municipal water systems. Numerous natural gaslines crisscross the area. Electric power is distributed by the larger towns or by power companies to towns and most rural areas.

Telephone service can be obtained throughout the area.

Industries

Industry is increasing in Lamar, Pike, and Upson Counties. There are about 16 manufacturers within the three counties. The manufacture of textiles is the main industry. Approximately 5,350 people are employed in the large plants in Upson and Lamar Counties. About 20 to 300 people per plant are employed in the other small industries, such as wearing apparel and food-processing plants.

The main wood products are pulpwood, veneer logs, and sawtimber. The number of people employed by the wood-processing industry has increased about 20 percent from 1950 to 1960.

Literature Cited

(1) American Association of State Highway Officials.
1961. standard specifications for highway materials and methods of sampling and testing. Ed. 8, 2 v., illus.

(2) Georgia Division of Mines, Mining and Geology
1939. geologic map of georgia. Prepared by Ga. Div. of Mines, Mining and Geol., in cooperation with the U.S. Dept. of Int., Geol. Survey, 1 p.

(3) Georgia Department of Public Health.
1964. recommendations for the design, operation, and maintenance of sewage oxidation ponds. 20 pp., illus.

(4) Simonson, Roy W.
1962. soil classification in the united states. Sci 137 1027–34, illus.

(5) Smith, George E., Jr.
1966. soil survey as a tool for forest managers. Soil Conservation, v. 32, No. 2.

(6) Thorp, James, and Smith, Guy D.
1949. higher categories of soil classification: order, suborder, and great soil groups. Soil Sci. 67: 117 126.

(7) United States Department of Agriculture.
1935. growth and yield of second-growth red gum in fully stocked stands on alluvial lands in the south. Southern Forest Expt. Sta., Occasional Paper No. 54. 12 pp., illus.

(8) ———
1938. soils and men. U.S. Dept. Agr. Ybk., pp. 978–1001, illus.

(9) ———
1951. soil survey manual. U.S. Dept. Agr. Handbook No. 18, 503 pp., illus.

(10) ———
1960. soil classification, a comprehensive system, 7th approximation. 265 pp., illus. [Supplements issued in March 1967 and September 1968]

(11) United States Department of Defense.
1968. unified soil classification system for roads, airfields, embankments, and foundations. MIL-STD 619B, 30 pp., illus.

(12) United States Department of Health, Education and Welfare.
1957. manual of septic-tank practice. Public Health Service. Pub. No. 526, 93 pp., illus. (Reprinted 1963)

(13) United States Department of the Interior.
1966. federal assistance in outdoor recreation. Bureau of Outdoor Recreation. No. 1, 83 pp. (Revised 1966.)

Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft. When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few*, *common*, and *many*; *size*—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are these: *fine*, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium*, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse*, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Natural soil drainage. Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and in Podzolic soils commonly have mottling below 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Percolation. The downward movement of water through the soil.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows:

Rapid.—More than 6.3 inches per hour.
Moderately rapid.—2.0 to 6.3 inches per hour.
Moderate.—0.63 inch to 2.0 inches per hour.
Moderately slow.—0.20 to 0.63 inch per hour.
Slow.—Less than 0.20 inch per hour.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	ph		*ph*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay*

loam, silty clay loam, sandy clay, silty clay, and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Upland (geological). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the soil series to which the mapping unit belongs. In referring to a capability unit, read the introduction to the section it is in for general information about its management. Other information is given in tables as follows:

Approximate acreage and proportionate extent of soils, table 1, p. 8.
Estimated yields, table 2, p. 31.
Use of soils in town and country planning, table 3, p. 32.
Use of the soils in engineering, tables 4, 5, and 6, pp. 42 through 53.
Use of the soils as woodland, table 7, p. 57.
Suitability of soils for wildlife habitat, table 8, p. 59.

Map symbol	Mapping unit	Described on page	Capability unit		Woodland group
			Symbol	Page	
AlB	Altavista sandy loam, 2 to 6 percent slopes	9	IIe-2	27	2w8
Alm	Alluvial land	9	IIw-2	27	1o7
AmB	Appling sandy loam, 2 to 6 percent slopes	10	IIe-2	27	3o7
AmC	Appling sandy loam, 6 to 10 percent slopes	10	IIIe-2	28	3o7
AnB3	Appling sandy clay loam, 2 to 6 percent slopes, severely eroded	10	IIIe-2	28	4c2e
AnC3	Appling sandy clay loam, 6 to 10 percent slopes, severely eroded	10	IVe-1	29	4c2e
Bfs	Buncombe loamy sand	11	IIIs-1	29	2s8
Cco	Chewacla complex, occasionally flooded	14	IIIw-2	28	1w8
Cwf	Chewacla and Wehadkee soils, frequently flooded	14	IVw-1	29	1w9
CYB2	Cecil sandy loam, 2 to 6 percent slopes, eroded	12	IIe-1	26	3o7
CYC2	Cecil sandy loam, 6 to 10 percent slopes, eroded	12	IIIe-1	27	3o7
CYE	Cecil sandy loam, 10 to 25 percent slopes	12	VIe-2	30	3r8
CYE2	Cecil sandy loam, 10 to 25 percent slopes, eroded	13	VIe-2	30	3r8
CZB3	Cecil sandy clay loam, 2 to 6 percent slopes, severely eroded	13	IIIe-1	27	4c2e
CZD3	Cecil sandy clay loam, 6 to 15 percent slopes, severely eroded	13	VIe-2	30	4c2e
DgB	Davidson loam, 2 to 6 percent slopes	15	IIe-1	26	3o7
DgC2	Davidson loam, 6 to 10 percent slopes, eroded	16	IIIe-1	27	3o7
DgD2	Davidson loam, 10 to 15 percent slopes, eroded	16	IVe-1	29	3o7
DhB3	Davidson clay loam, 2 to 6 percent slopes, severely eroded	16	IIIe-1	27	4c2e
DhC3	Davidson clay loam, 6 to 10 percent slopes, severely eroded	16	IVe-1	29	4c2e
DhE3	Davidson clay loam, 10 to 25 percent slopes, severely eroded	16	VIe-2	30	4c2e
Gul	Gullied land	17	VIIe-4	30	----
HVB	Holston sandy loam, 2 to 6 percent slopes	18	IIe-2	27	3o7
HVD	Holston sandy loam, 6 to 15 percent slopes	18	IVe-1	29	3o7
HYB	Helena sandy loam, 2 to 6 percent slopes	17	IIe-4	27	3w8
LmD	Louisburg stony soils, 6 to 15 percent slopes	18	VIIe-2	30	3x3
MgB2	Madison sandy loam, 2 to 6 percent slopes, eroded	19	IIe-1	26	3o7
MgC2	Madison sandy loam, 6 to 10 percent slopes, eroded	19	IIIe-1	27	3o7
MgD2	Madison sandy loam, 10 to 15 percent slopes, eroded	19	IVe-1	29	3o7
MgE	Madison sandy loam, 15 to 25 percent slopes	20	VIe-2	30	3r8
MHF	Mountainburg cobbly fine sandy loam, 15 to 45 percent slopes	21	VIIe-2	30	4r2
MiB3	Madison sandy clay loam, 2 to 6 percent slopes, severely eroded	20	IIIe-1	27	4c2e
MiD3	Madison sandy clay loam, 6 to 15 percent slopes, severely eroded	20	VIe-2	30	4c2e
MtC	Molena loamy sand, 2 to 10 percent slopes	20	IVs-1	29	3s2
PkB	Pacolet stony loam, 2 to 6 percent slopes	21	IIIe-1	27	3x3
PkC	Pacolet stony loam, 6 to 10 percent slopes	22	IVe-1	29	3x3
PmB	Pacolet gravelly sandy loam, 2 to 6 percent slopes	22	IIe-1	26	3o7
PmD	Pacolet gravelly sandy loam, 6 to 15 percent slopes	22	IVe-1	29	3o7
Roc	Rock land	22	VIIIs-1	30	----
Sto	Starr soils	22	I-1	26	1o7
WEC	Wilkes and Enon soils, 2 to 10 percent slopes	24	IVe-4	29	4o1
WEE	Wilkes and Enon soils, 10 to 25 percent slopes	25	VIIe-2	30	4r2
Wed	Wehadkee soils, frequently flooded	23	IVw-1	29	1w9
Weh	Wehadkee silty clay loam, frequently flooded	23	IVw-1	29	1w9
WsB	Wickham gravelly sandy loam, 2 to 6 percent slopes	24	IIe-1	26	3o7
WsC	Wickham gravelly sandy loam, 6 to 10 percent slopes	24	IIIe-1	27	3o7

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

SPALDING COUNTY

BUTTS COUNTY

SPALDING COUNTY

MERIWETHER COUNTY

MONROE COUNTY

PIKE COUNTY / UPSON COUNTY

LAMAR COUNTY / UPSON COUNTY

MERIWETHER COUNTY

MONROE COUNTY

TALBOT COUNTY

TAYLOR COUNTY

CRAWFORD COUNTY

N

SOIL ASSOCIATIONS

NEARLY LEVEL SOILS OF THE FLOOD PLAINS

1 Wehadkee-Toccoa Alluvial association—Chiefly poorly drained and somewhat poorly drained level to nearly level soils on flood plains subject to flooding; 0 to 2 percent slopes

VERY GENTLY SLOPING AND SLOPING SOILS OF THE UPLANDS

2 Cecil-Davidson-Appling association—Well-drained soils that have red, yellowish red, or yellowish brown clayey layers below the surface layer; on uplands, ridges, 2 to 10 percent slopes

3 Madison-Pacolet association—Well drained soils that have mainly red clayey layers below the surface layer; mostly gently broad, rounded tops, 2 to 6 percent slopes

4 Pacolet-Appling association—Well-drained soils that have predominantly red and yellowish brown clayey layer below the surface layer; on uplands, 2 to 10 percent slopes

5 Appling-Helena association—Well drained and moderately well drained soils that have mainly a yellowish brown, mottled clayey layer below the surface layer, on uplands, 2 to 6 percent slopes

6 Holston-Helena association—Well-drained and somewhat excessively drained soils that have a yellowish brown to yellowish red loamy and sandy layer below the surface layer; on uplands, 2 to 10 percent slopes

SLOPING AND MODERATELY STEEP SOILS OF THE UPLANDS

7 Davidson-Cecil-Madison association—Well-drained soils that have a dusky red to red clayey layer below the surface layer; on narrow, winding ridgetops and hillsides, 10 to 25 percent slopes

CHIEFLY GENTLY SLOPING AND STEEP, COBBLY AND STONY SOILS OF THE UPLANDS

8 Mountainburg-Pacolet association—Well drained, mainly cobbly soils that have yellowish red to red loamy and clayey layers below the surface layer; on uplands, 1 to 45 percent slopes

9 Wickham-Enon association—Mainly shallow, well-drained soils that have yellowish brown and dark yellowish brown mainly clayey layers below the surface layer; on uplands, 2 to 25 percent slopes

NOTE

This map is intended for general planning [illegible]

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATIONS

GENERAL SOIL MAP

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA

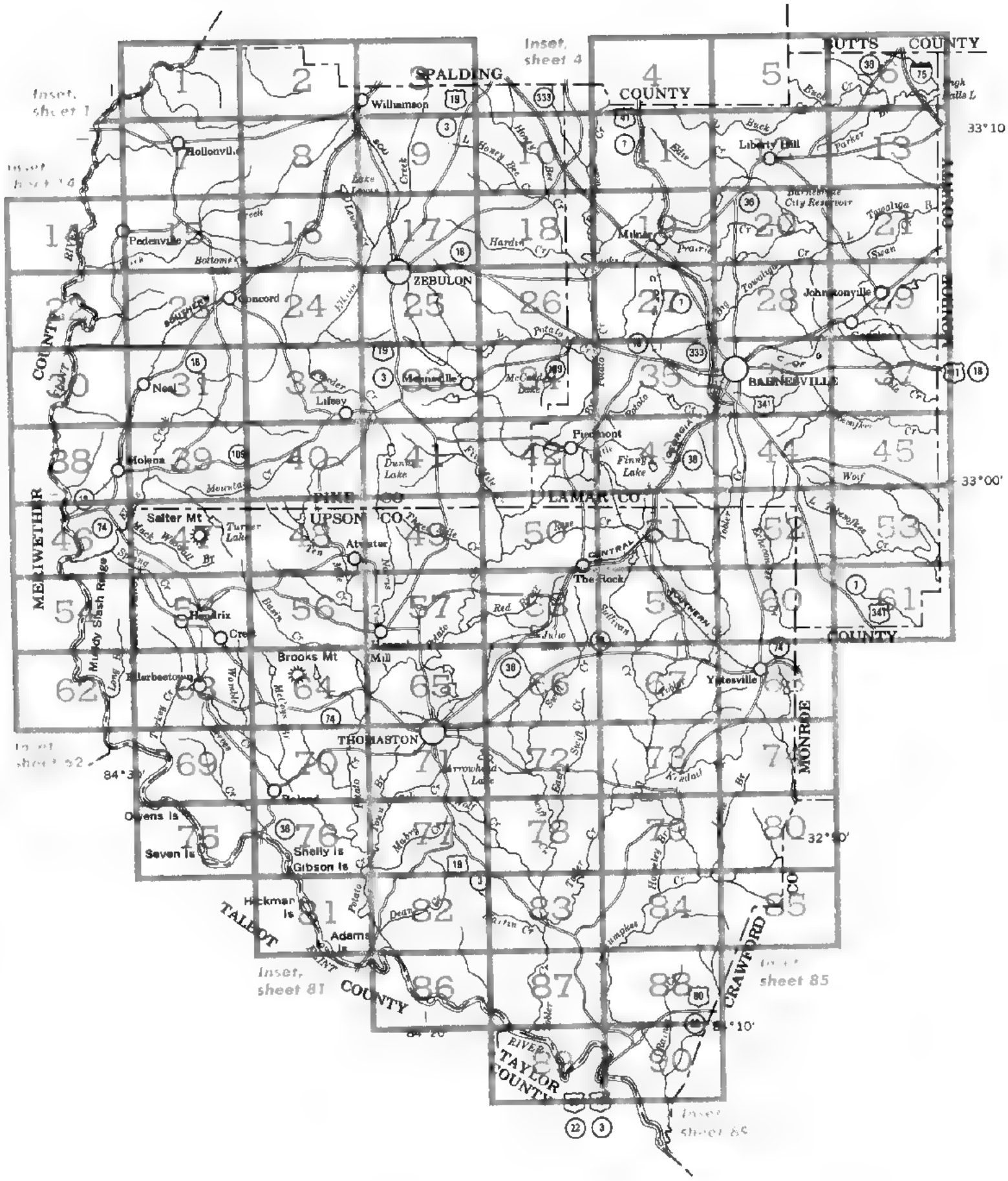
N

INDEX TO MAP SHEETS

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA

Scale 1:253,440

1 0 1 2 3 4 Miles



SOIL LEGEND

The first letter in each symbol is the initial one of the soil name. If the third letter is a capital it shows the range of slope, from B, 2 to 6 percent slopes, to F, more than 25 percent. Most symbols without a slope letter are those of nearly level soils, but the land types "Gullied land" and "Rock land" have a considerable range of slope. Soils that are named as eroded or severely eroded have a final number, 2 or 3, in their symbol.

SYMBOL	NAME
AlB	Altavista sandy loam, 2 to 6 percent slopes
Alm	Alluvial land
AmB	Appling sandy loam, 2 to 6 percent slopes
AmC	Appling sandy loam, 6 to 10 percent slopes
AnB3	Appling sandy clay loam, 2 to 6 percent slopes, severely eroded
AnC3	Appling sandy clay loam, 6 to 10 percent slopes, severely eroded
Bfs	Buncombe loamy sand
Ccp	Chewacla complex, occasionally flooded
Cwf	Chewacla and Wehadkee soils, frequently flooded
CYB2	Cecil sandy loam, 2 to 6 percent slopes, eroded
CYC2	Cecil sandy loam, 6 to 10 percent slopes, eroded
CYE	Cecil sandy loam, 10 to 25 percent slopes
CYE2	Cecil sandy loam, 10 to 25 percent slopes, eroded
CZB3	Cecil sandy clay loam, 2 to 6 percent slopes severely eroded
CZD3	Cecil sandy clay loam, 6 to 15 percent slopes, severely eroded
DgB	Davidson loam, 2 to 6 percent slopes
DgC2	Davidson loam, 6 to 10 percent slopes, eroded
DgD2	Davidson loam, 10 to 15 percent slopes, eroded
DhB3	Davidson clay loam, 2 to 6 percent slopes, severely eroded
DhC3	Davidson clay loam, 6 to 10 percent slopes, severely eroded
DhE3	Davidson clay loam, 10 to 25 percent slopes, severely eroded
Gu	Gullied land
HVB	Holston sandy loam, 2 to 6 percent slopes
HVD	Holston sandy loam, 6 to 15 percent slopes
HYB	Helena sandy loam, 2 to 6 percent slopes
LmD	Louisburg stony soils, 6 to 15 percent slopes
MgB2	Madison sandy loam, 2 to 6 percent slopes, eroded
MgC2	Madison sandy loam, 6 to 10 percent slopes, eroded
MgD2	Madison sandy loam, 10 to 15 percent slopes, eroded
MgE	Madison sandy loam, 15 to 25 percent slopes
MHF	Mountainburg cobbly fine sandy loam, 15 to 45 percent slopes
MtB3	Madison sandy clay loam, 2 to 6 percent slopes, severely eroded
MtD3	Madison sandy clay loam, 6 to 15 percent slopes, severely eroded
MtC	Molena loamy sand, 2 to 10 percent slopes
PkB	Pacolet stony loam, 2 to 6 percent slopes
PkC	Pacolet stony loam, 6 to 10 percent slopes
PmB	Pacolet gravelly sandy loam, 2 to 6 percent slopes
PmD	Pacolet gravelly sandy loam, 6 to 15 percent slopes
Roc	Rock land
Sto	Starr soils
WEC	Wilkes and Enon soils, 2 to 10 percent slopes
WEE	Wilkes and Enon soils, 10 to 25 percent slopes
Wed	Wehadkee soils, frequently flooded
Weh	Wehadkee silty clay loam, frequently flooded
WsB	Wickham gravelly sandy loam, 2 to 6 percent slopes
WsC	Wickham gravelly sandy loam, 6 to 10 percent slopes

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Tunnel

Buildings
- School
- Church

Mine and quarry

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Windmill

BOUNDARIES

- National or state
- County
- Reservation
- Land grant
- Small park, cemetery, airport

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches (CANAL)

Lakes and ponds
- Perennial (water)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Alluvial fan

Drainage end

RELIEF

Escarpments
- Bedrock
- Other

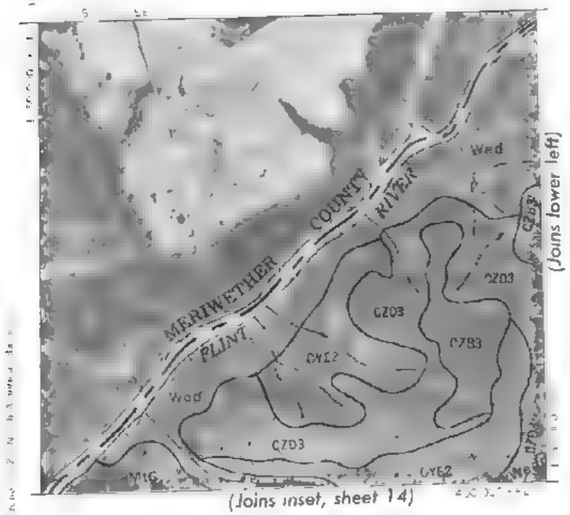
Prominent peak

Depressions (Large / Small)
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness: Stony; Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully

Soil map constructed 1969 by Cartographic Division, Soil Conservation Service, USDA, from 1964 and 1965 aerial photographs. Controlled mosaic based on Georgia plane coordinate system, west zone, transverse Mercator projection, 1927 North American datum


MERIWETHER COUNTY
FLINT RIVER
Wed
CZD3
CZB3
CYE2
MtC
(Joins lower left)
(Joins inset, sheet 14)

SPALDING COUNTY
MERIWETHER COUNTY
FLINT RIVER
Neh
CYE2
AmC
MtC
AmB
PkB
CZD3
CZB3
CYB2
CYC2
Wed
Sto
LmD
HyB
PkC
PkB
DgB
CZB1
(Joins upper right)
(Joins sheet 2)
(Joins sheet 7)
N
Scale 1 15 840

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 2

(2)

N

Scale 1:15,840

1 Mile

5,000 feet

SPALDING COUNTY

SPALDING COUNTY

Williamson

(Joins sheet 1)

(Joins sheet 8)

(Joins sheet 3)

420,000 FEET

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 3

440 000 FEET

165 000 FEET

3

N

1 Mile

5000 feet

Scale 1:15 840

SPALDING COUNTY

Williamson

Mt Gilead Church

(Joins sheet 2)

(Joins inset, sheet 4)

(Joins sheet 9)

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 4

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 4

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 5

5

N

500 000 FEET

1 168 500 FEET

BUTTS COUNTY

SPALDING COUNTY

Rock Springs Church

Creek

Wed

Branch

Cable

(Joins sheet 4)

(Joins sheet 6)

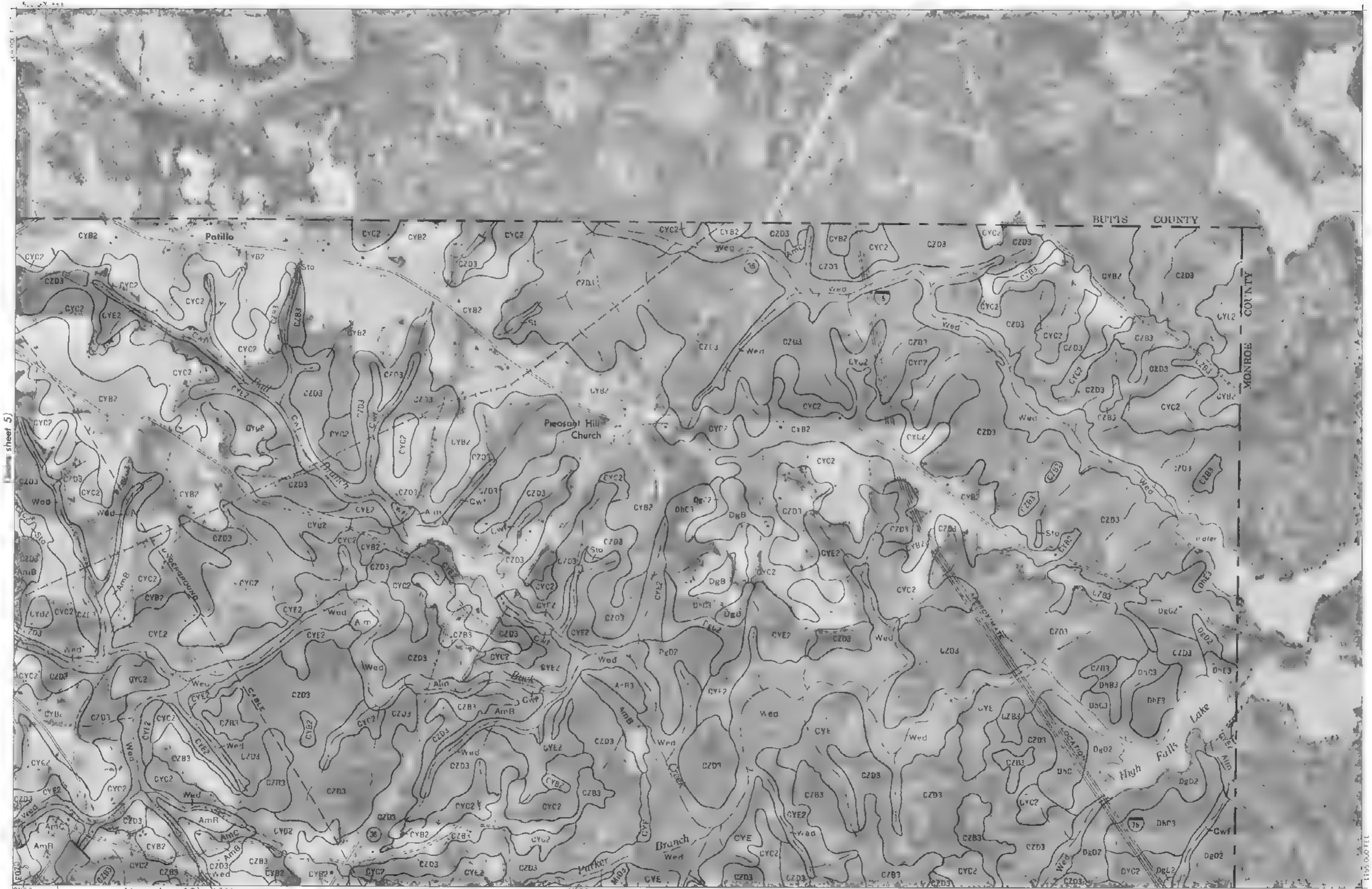
(Joins sheet 12)

Scale 1:15 840

LAMAR PIKE AND UPSON COUNTIES GEORGIA NO 5

This map is one of a set completed in 1970 as part of a soil survey by the United States Department of Agriculture Soil Conservation Service and the University of Georgia College of Agricultural Experiment Stations

Photobase from 1965 aerial photographs. Grid values based on Georgia plane coordinate system, west zone 1927 North American datum


BUTTS COUNTY
MONROE COUNTY
Patillo
Pleasant Hill Church
High Falls Lake
Branch
Creek
(Jams sheet 13)
(Jams sheet 5)
Scale 1:15 840
1:15 000 FEET

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 7

(Joins sheet 1)

(Joins inset, sheet 14)

(Joins sheet 8)

(Joins sheet 15)

Hollonville

N

Scale 1:15,840

1 000 0 1 000 2 000 3 000 4 000 5 000 Feet

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 7

N

1 Mile

5,000 Feet

Scale 1:15 840

1 0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

420 000 FEET

1°55'00" FEE

(Joins sheet 2)

(Joins sheet 7)

(Joins sheet 9)

(Joins sheet 16)

Lake Lewis

DhC3 DgC2 440 000 FEET

Photographed on 1955 aerial photographs. Grid values based on Georgia state coordinate system, west zone, 1927 North American datum.

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture Soil Conservation Service and the University of Georgia College of Agricultural Experiment Stations.

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 8

(Joins sheet 3)

(Joins sheet 8)

(Joins sheet 10)

(Joins sheet 17)

(10)

N

1 Mile

5000 Feet

0 ¼ ½ ¾ 1

Scale 1:15,840

1 000 2 000 3 000 4 000

(Joins inset, sheet 4)

(Joins sheet 9)

(Joins sheet 18)

(Joins sheet 11)

Pine Grove Church

Friendship Church

Little Horsey Creek

Wed

Sto

HYB

AmB

AmC

CZD3

CYB2

CYC2

DgB

DhB3

DhC3

CZB3

CWf

MgB2

MgC2

MlD3

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 11

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 11

(12)

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1000 2000 3000 4000 5000

(Joins sheet 5)

(Joins sheet 11)

(Joins sheet 13)

(Joins sheet 20)

Liberty Hill

Shiloh Church

Pumping Station

Weldon Pond

Creek

CZD3 CYB2 CYC2 CZB3 CYE2 AmB AmC MgB2 MgC2 MiB3 MiD3 MiC2 DgB DgC2 DhB3 DhC3 DhE3 PkB PkC Wed Cwf Sto

UPSON COUNTY, GEORGIA NO. 12
LAMAR, PIKE AND

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 13

N

(Joins sheet 6)

(Joins sheet 12)

(Joins sheet 21)

COUNTY

Unionville Church

High Shoals Church

Scale 1:5840

1 Mile

5000 Feet

(14)

N

Scale 1:15 840

(Joins inset, sheet 1)

(Joins sheet 7)

(Joins upper right)

(Joins lower left)

(Joins sheet 15)

(Joins sheet 22)

Pedenville

FLINT RIVER

MERIWETHER COUNTY

Birch Creek

MtC DgB DgC2 CZB3 CZD3 CYB2 CYC2 CYE2 AmB AmC HYB Wed Sto Cwf PkB PkC LmD Alm AtB AtC Gut

N

(Joins sheet 7)

(Joins sheet 14)

(Joins sheet 16)

(Joins sheet 23)

Friendship Church

Birch Creek

Birch Creek

Bottoms Lake

Pike County School

Scale 1:15 840

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 feet

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NO. 15

N

Scale 1:15840

1 Mile

1,000 Feet

(Joins sheet 8)

(Joins sheet 15)

(Joins sheet 24)

(Joins sheet 17)

Reidsboro

Lake Lewis

Jolly

Birch Creek

Lewis Creek

(Joins sheet 9)

(Joins sheet 16)

(Joins sheet 18)

(Joins sheet 25)

ZEBULON
County Seat

17

N

Scale 1:24,000

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 18

(18)

N

Scale 1:15,840

1 inch = 5,000 feet

(Joins sheet 10)

(Joins sheet 17)

(Joins sheet 19)

(Joins sheet 26)

New Hope Church

Little Hurricane Creek

Hurricane Creek

Potato Creek

Lucks Lake

Hollis Creek

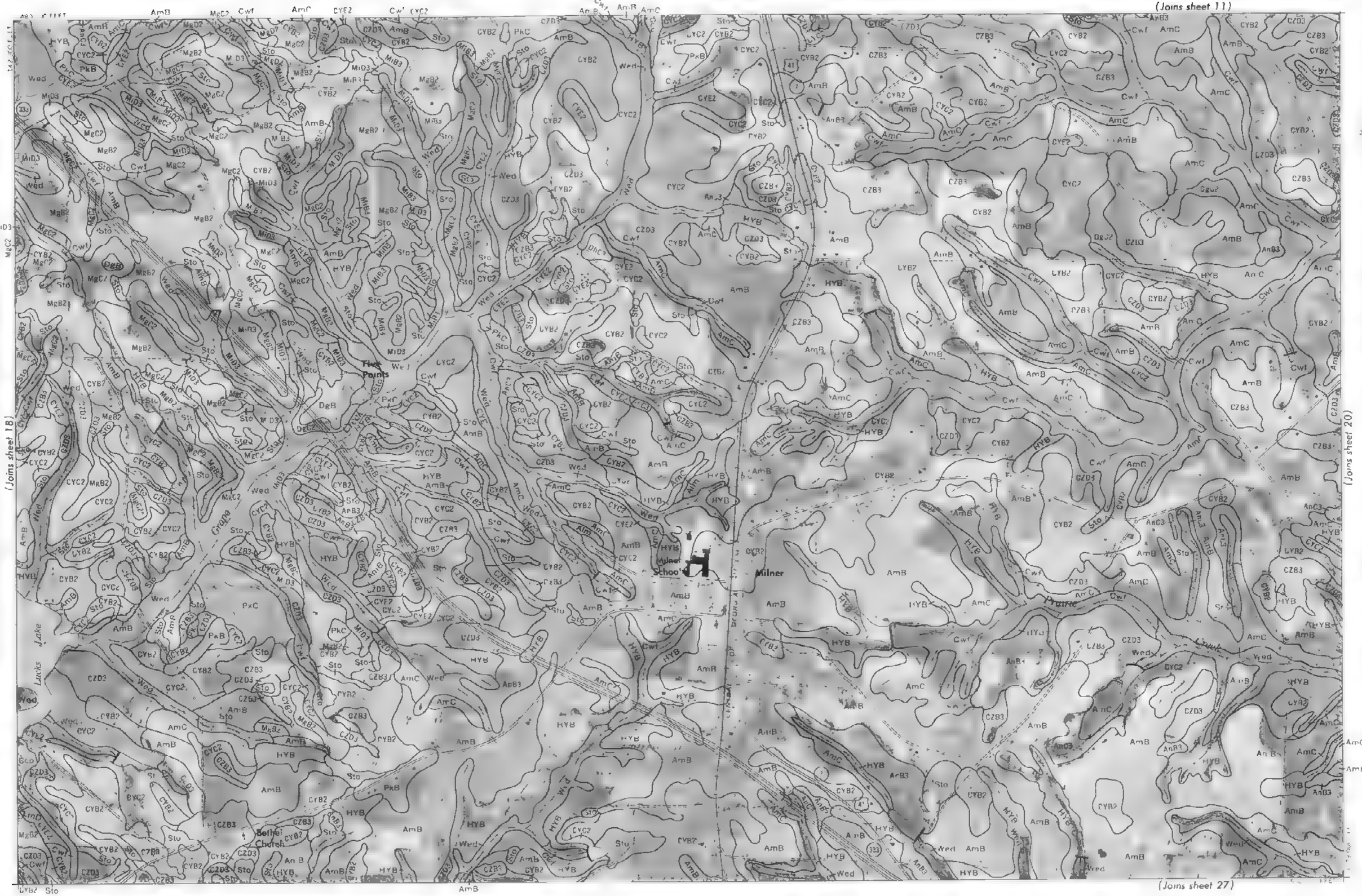
LAMAR COUNTY

PIKE COUNTY

UPSON COUNTY

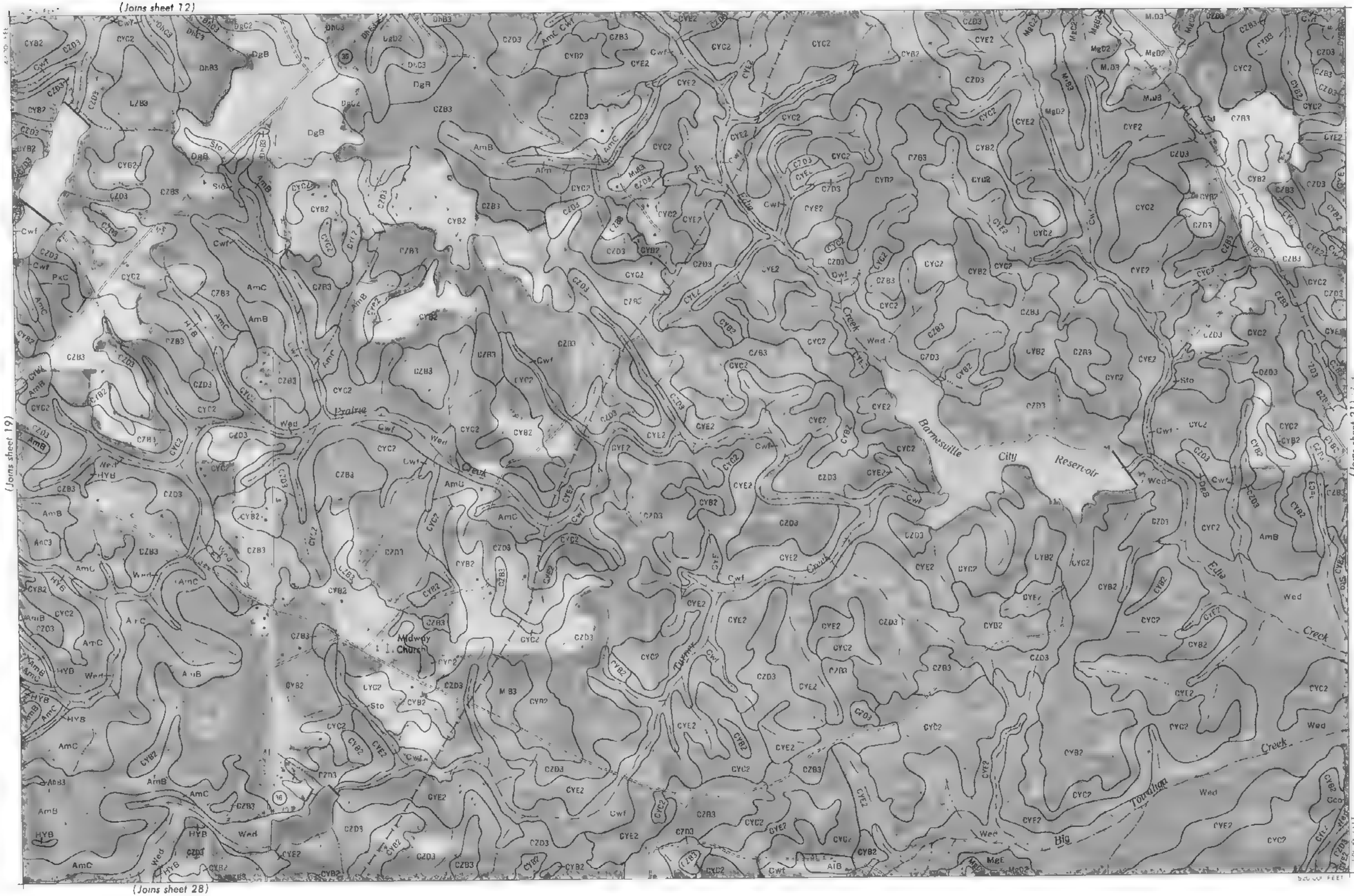
AMB PkC MgB2 MgC2 MiB3 MiD3 CZB3 CZD3 CYB2 CYC2 CYE2 AmB AmC DgB DgC2 DgD2 DhC3 DkB DkC3 DrB Wed Sto Cwf Cwt HYB LmD Alm Cco Dge

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 19



LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 19

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 20



(Joins sheet 13)

(Joins sheet 20)

(Joins sheet 29)

21

N

Little Towaliga River

Edie Creek

Big Towaliga Cr

FLEMING CEMETERY

MONROE COUNTY

Scale 1:5840

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO 2

N

1 Mile

5,000 Feet

Scale 1:15,840

(Joins sheet 14)

(Joins sheet 23)

(Joins sheet 30)

FLINT RIVER

MERIWETHER COUNTY

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA 22

(Joins sheet 15)

(Joins sheet 22)

(Joins sheet 24)

(Joins sheet 31)

Hebron Church

Concord

SOUTHERN

N

Scale 1:15 840

0 2000 4000 6000 FEET

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO 23

This map was produced by the Soil Conservation Service and the University of Georgia College of Agriculture Experiment Stations
Agriculture = Conservation Service and the University of Georgia College of Agriculture Experiment Stations
Soil surveys by the United States Department of Agriculture, Soil Conservation Service and the University of Georgia College of Agriculture Experiment Stations
Base map from Georgia land use data system, W.S. A. 1972 North American datum
Soil boundaries, symbols, and descriptions were compiled and adjusted to a modified version of base imagery at a scale of 1:15 840
Field checked 1975 Soil Survey Manuscript 1977
For sale by the National Cartographic Information Center, U.S. Geological Survey, Reston, Virginia 22092
A fee may be required for purchase. Additional maps and publication information may be obtained from the Soil Conservation Service or the Georgia Agricultural Experiment Stations

(24)

N

(Joins sheet 16)

(Joins sheet 23)

(Joins sheet 25)

(Joins sheet 32)

Scale 1:15,840

1 Mile

1/4 0 1/4 1/2 3/4 1

5,000 Feet

1,000 0 1,000 2,000 3,000 4,000 5,000

U.S. GOVERNMENT PRINTING OFFICE: 1978 O-261-526

(Joins sheet 17)

(Joins sheet 24)

(Joins sheet 26)

(Joins sheet 33)

ZEBULON
(county seat)

Pike County High School

N

Scale 1:15 840

1 000 0 1 000 2 000 3 000 4 000 Feet

LAMAR, PIKE AND UPSON COUNTIES, GEORGIA NO. 25


(Joins sheet 18)
(Joins sheet 25)
(Joins sheet 34)
(Joins sheet 27)
Nazareth Church
Mt Calvary Church
Ebenezer Church
Little Potato Creek
Big Potato Creek
PIKE COUNTY
LAMAR COUNTY
N
Scale 1:15,840
1 MILE
1,000 FEET

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 27

(Joins sheet 19)

(Joins sheet 26)

(Joins sheet 28)

(Joins sheet 35)

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 27

N

Scale 1:5,000

1 MILE

1 KILOMETER

(Joins sheet 20)

(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 36)

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000

Tobaliga Creek

Big Tobaliga Creek

Tippar Creek

Hog Mountain

Lookout Tower

Bethel Church

Sto

DgB

MHF

PmD

PmB

AmB

AmC

AmB3

AlB

Alm

Cwf

Wed

HYB

CZB3

CZD3

CYB2

CYC2

CYE2

CYL2

MgB2

MgC2

MgD2

MgE

MiB3

MiD3

MrB2

MrL2

MsD2

Ccc

DnB3

DnE3

3to

HVD

Lake

Creek

Cemetery

Church

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 28

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 29

(Joins sheet 21)

(Joins sheet 28)

(Joins sheet 37)

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 29

Johnstonville

Geggus

Ranoboth Church

FAIRBROOK CEMETERY

Rocky Creek

Wed Creek

Cwt Creek

Sto

N

MONROE COUNTY

1:15,840

Scale

(30)

N

Scale 1:15,840

1 MILE

5,000 FEET

(Joins sheet 22)

(Joins sheet 31)

(Joins sheet 38)

(18)

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NO. 30

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 31

N

(Joins sheet 23)

(Joins sheet 30)

(Joins sheet 32)

(Joins sheet 39)

Neal

Elkins Creek

SOUTHERN

BORROW PIT

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 31

(32)

N

(Joins sheet 24)

Powder Creek Church

Elkins

Creek

Powder

Creek

Lifsey Springs

(Joins sheet 31)

(Joins sheet 33)

(Joins sheet 40)

Scale 1:15 840

1 inch = 1 250 feet

1 000 0 1 000 2 000 3 000 4 000 5 000 Feet

1/2 0 1/2 1 Mile

AMAR, PIKE AND UPSON COUNTIES, GEORGIA 32

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NO. 33

(Joins sheet 26)

(Joins sheet 33)

(Joins sheet 35)

(Joins sheet 42)

N

Scale 1:15840

Little Potato Creek

McCart Lake

Pine Mtn

PINE VALLEY GIRL SCOUTS

SOUTHERN

LAMAR COUNTY

PIKE COUNTY

Wed

Sto

Cwf

Cco

Weh

MHF

Pne Mtn

CZB3

CZD3

CYB2

CYC2

CYE2

DgB

DgC2

DgD2

DhB3

DhC3

DhE3

AmB

AmC

HVB

HVC

HVD

PmB

PmD

WsB

WsC

MgC2

MgD2

MlB3

MlD3

(Joins sheet 27)

(Joins sheet 34)

(Joins sheet 36)

(Joins sheet 43)

Scale 1:15 840

(Joins sheet 28)

(Joins sheet 35)

(Joins sheet 37)

(Joins sheet 44)

N

Scale 1:15,840

1/4 1/2 3/4

1,000 2,000 3,000 4,000 5,000 Feet

BARNESVILLE
(county seat)

Gordon Military College

Green Mt. Church

Creek

Tobesofkee

GEORGIA CENTRAL

(Joins sheet 29)

(Joins sheet 36)

(Joins sheet 45)

37

N

Scale 1:15 840

Rocky Mount Church

Shiloh Church

Fairh Church

MONROE COUNTY

GEORGIA

Creek

Wed

Sto

Cwl

Cwf

Amf

Lmd

Pkb

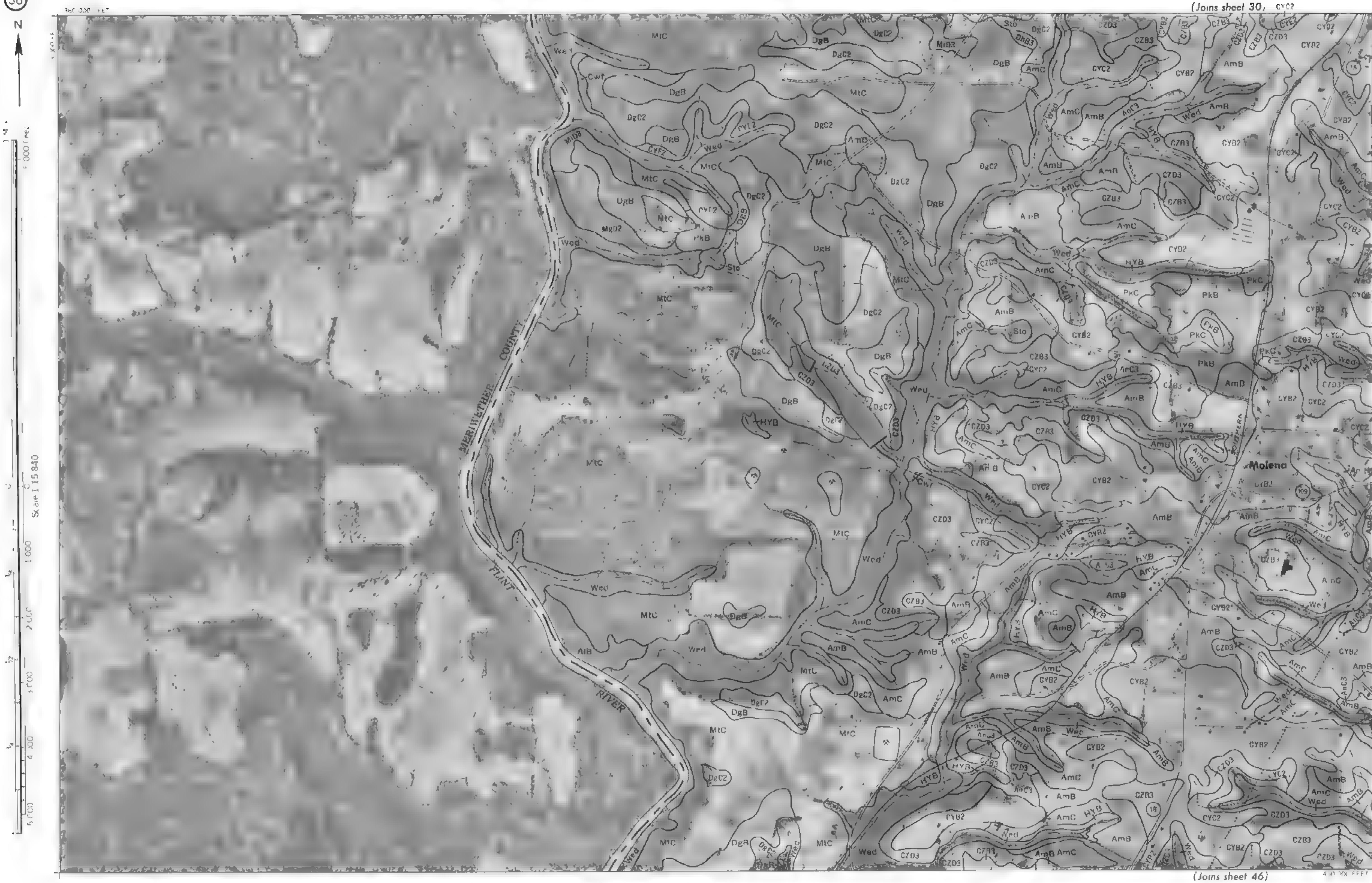
Hyb

Rng

Tybee-Olhe

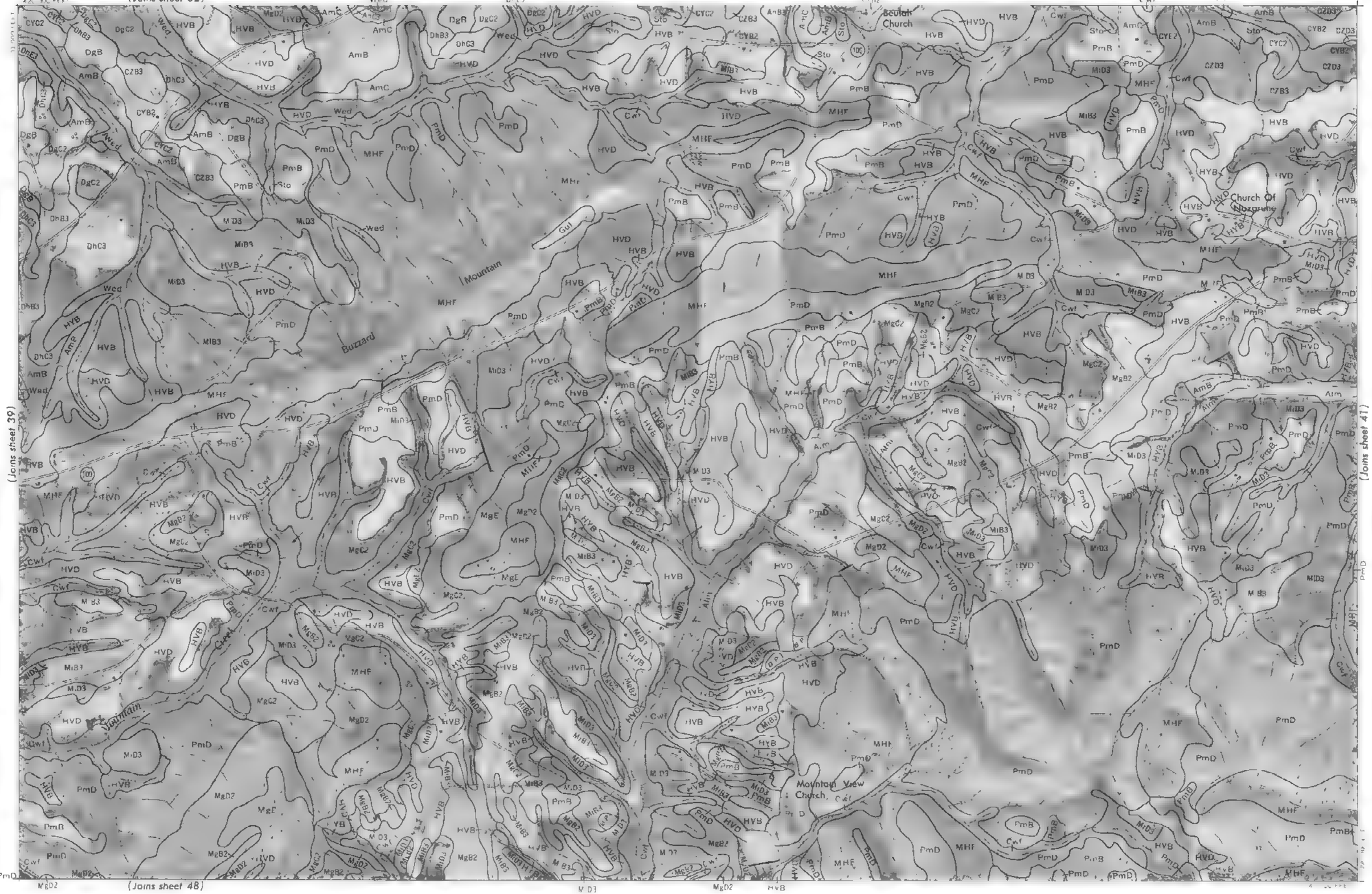
SHERAN CEMETERY

GAIN CEMETERY


N
Scale 1:15 840
(Joins sheet 30)
(Joins sheet 39)
(Joins sheet 46)
MERIWETHER COUNTY
FLINT RIVER
Molena
SOUTHERN
MtC
DgB
DgC2
Wed
AmB
AmC
CYB2
CYC2
CZB3
CZD3
HYB
PkB
PkC
Sto
Cwf
AfB
HYD

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 39

(Joins sheet 32)



(Joins sheet 39)

(Joins sheet 48)

(Joins sheet 41)

1 Mile

1/2 0 1/2

Scale 1:15 840

0 1000 2000 3000 4000 5000

N

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 40

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 41

(41)

N

(Joins sheet 33)

(Joins sheet 40)

(Joins sheet 42)

(Joins sheet 49)

Rose Hill

Liberty Church

Dunns Lake

Clearwater Springs

Nazarene Church

Radio Relay Station

Scale 1:15 840

PIKE CO. — UPSON CO.

(42)

N

(Joins sheet 34)

(Joins sheet 41)

(Joins sheet 43)

(Joins sheet 50)

Scale 1:15 840

Century Nelson Church

Piedmont

PIKE COUNTY

LAMAR COUNTY

PIKE

UPSON

Big Potato Creek

Little Potato Creek

Flint River

Mile Creek

Sawnee Creek

Harris Creek

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 43

(43)

N

(Joins sheet 35)

(Joins sheet 42) Wed

(Joins sheet 44)

(Joins sheet 51)

Scale 1:15 840

0 1000 2000 4000 5000 Feet

Funny Lake

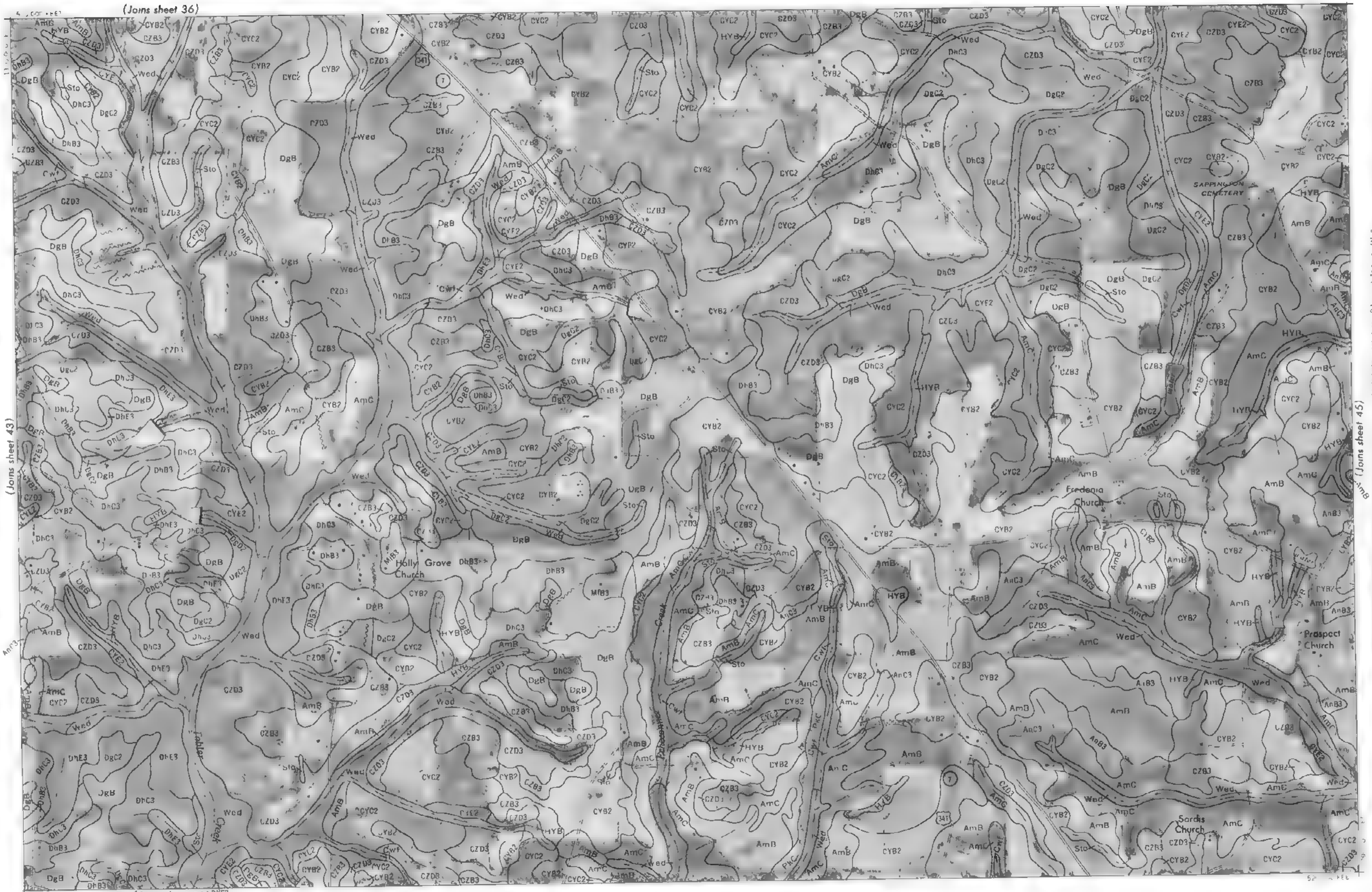
Midway Church

Creek

GEORGIA

AmB AmC AmC3 AnB AnC3 AtB CYB2 CYC2 CYE2 CZB3 CZD3 DgB DhB3 DhC3 DnC3 DuB2 DuC2 DuC3 DxC2 HYB Sto Wed

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA – SHEET NUMBER 44



(Joins sheet 37)

(Joins sheet 44)

(Joins sheet 53)

MONROE COUNTY

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 45

45

N

Scale 1:24,000

1 0 1 2 3 4 5 MILE

1 0 1 2 3 4 5 KILOMETER

N

Scale 1:15,840

(Joins sheet 38)

(Joins sheet 47)

(Joins sheet 54)

FLINT RIVER

MERIWETHER COUNTY

PIKE COUNTY

UPSON COUNTY

Lawrences Mill

DRIPPING ROCK CEMETERY

CAMP THUNDER BSA

BORROW PIT

Pikins Creek

Spring Creek

White Plains Church

Knight Branch

Southern Branch

DgB DgC2 DrC2 MtC AlB DhE3 DhC3 DhF3 DhC3 AmB AmC CZD3 CZB3 CYB2 CYC2 HYB Wed Cwf Cco MgC2 MgD2 MIB3 MID3 WsB WsC MHF PmD Bfs Aim Roc

(Joins sheet 39)

(Joins sheet 46)

(Joins sheet 48)

(Joins sheet 55)

PIKE COUNTY
UPSON COUNTY

Turners Lake

Mountain

Dursler Mtn

Creek

Branch

Spring

BORROW PIT

N

Scale 5,843

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NO. 47

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 48

48

N

(Joins sheet 40)

PIKE COUNTY
UPSON COUNTY

Smyrna Ch & Cem

Bull Trail Mountain

Ten Mile

Atwater

(Joins sheet 47)

(Joins sheet 49)

(Joins sheet 56)

Scale 1:15 840

1 Mile

5,000 Feet

1,000 Meters

SOIL SURVEY OF LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 48

(Joins sheet 41)

(Joins sheet 48)

(Joins sheet 50)

(Joins sheet 57)

PIKE COUNTY
UPSON COUNTY

Shiloh Church

N

Scale 1:15 840

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 49

N

Scale 1:15 840

(Joins sheet 42)

(Joins sheet 49)

(Joins sheet 58)

(Joins sheet 51)

PIKE COUNTY

UPSON COUNTY

LAMAR COUNTY

Shattuck Creek

Mile Creek

Potato Creek

The Rock

CENTRAL OF GEORGIA

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 50

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 51

N

(Joins sheet 43)

LAMAR COUNTY
UPSON COUNTY

GEORGIA

SOUTHERN CENTRAL

Topeka Junction

Rose Creek

Mt Olive Church

St Timothy Church

CHEEK CEMETERY

SALEM CEMETERY

(Joins sheet 50)

(Joins sheet 52)

(Joins sheet 59)

Scale 1:15 840

5 000

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 51

52

N

500 000 FEET

(Joins sheet 44)

LAMAR COUNTY
UPSON COUNTY

Antioch Church

SARDIS CEMETERY

STALLINGS CEMETERY

Tobler Creek

Little Tobesofkee Creek

Scale 1:15 840

1 Mile

1 000 Feet

(Joins sheet 51)

(Joins sheet 53)

(Joins sheet 60)

520 000 FEET

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 52

(Joins sheet 45)

(Joins sheet 52)

(Joins sheet 61)

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NO. 53

54

N

1 Mile

5,000 Feet

Scale 1:15,840

0 ¼ ½ ¾ 1

1,000 0 1,000 2,000 3,000 4,000 5,000 FEET

(Joins sheet 46)

(Joins sheet 55)

(Joins sheet 62)

This map was compiled on 1974 aerial photographs. Grid ticks based on Georgia coordinate system west zone 1927 North American datum.
This survey was conducted by the Soil Conservation Service and the University of Georgia College of Agricultural Experiment Stations
and the Georgia Department of Agriculture as part of a soil survey of Lamar, Pike, and Upson Counties, Georgia.

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 55

(55)

N

(Joins sheet 47)

(Joins sheet 54)

(Joins sheet 56)

(Joins sheet 63)

Scale 1:5,840

Spring Creek

Indian Creek

Hurricane Creek

Robert Green Hill

Midway Church

Van Houten Mtn

McGraw Mtn

Crest

Great Nazarene Church

Hendrix

Hendricks Church

Hebron Church

Davis Road

Jeff Busn

Creek

Branch

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 56

56

N

(Joins sheet 48)

(Joins sheet 55)

(Joins sheet 64)

(Joins sheet 57)

Scale 1 to 840

0 1/4 1/2 3/4 1 Mile

0 1000 2000 3000 4000 5000 6000 Feet

Willingham Spring Creek

Mile Creek

Aim Creek

Basin Creek

Joes Chapel

New Bethel Church

JEFF DAVIS ROAD

LAMAR, PIKE AND UPSON COUNTIES, GEORGIA

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 57

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 57

58

N

(Joins sheet 50)

(Joins sheet 57)

(Joins sheet 66)

(Joins sheet 59)

Bethany Church

Rock Hill Elem School

Julia Lake

Sandy Grove Church

Liberty Chapel

Scale 1:15 840

0 1/4 1/2 3/4 1 Mile

0 1,000 2,000 3,000 4,000 5,000 Feet

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 58

(Joins sheet 51)

(Joins sheet 58)

(Joins sheet 60)

(Joins sheet 67)

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 60

(60)

N

1 Mile

5,000 Feet

Scale 1:15,840

(Joins sheet 52)

(Joins sheet 59)

(Joins sheet 68)

(Joins sheet 61)

Bethlehem Temple

LAMAR COUNTY

UPSON COUNTY

MONROE COUNTY

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 60

(Joins sheet 53)

(Joins sheet 60)

MONROE COUNTY

MONROE COUNTY

N

Scale 1:15840

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 61

N

Scale 1:15 840

(Joins sheet 54)

(Joins lower right)

(Joins sheet 69)

(Joins sheet 63)

(Joins upper left)

MERIWETHER CO

MERIWETHER COUNTY

TALBOT COUNTY

FLINT RIVER

Muddy Ridge

Sash Mtn

Spring Mtn

Tally Gap

Goat Mtn

Spring Mtn

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 62

(Joins sheet 55) HVD HVB MiD3

(Joins sheet 62)

(Joins sheet 64)

(Joins sheet 69)

N

Scale 1:15 840

Ellerbeetown

Hurricane

Moss

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NO. 63

(64)

N

Scale 1:15 840

(Joins sheet 56)

(Joins sheet 63)

(Joins sheet 70)

(Joins sheet 65)

Pickpocket

Thurston School

Friendship Church

Fellowship Church

Brooks Mtn

Kings Mtn

Creek

Branch

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 64

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 65

(66)

N

(Joins sheet 58)

(Joins sheet 65)

(Joins sheet 67)

(Joins sheet 72)

Scale 1:15 840

Pine Chapel

TRICE CEMETERY

GEORGIA

Aim

Creek

Branch

Swift

Cwf

Wed

Sto

DhB3 DhC3 DhE3 DgB DgC2 DgD2 DgE3 DhC34 DlC3 DlE3 AmB CYB2 CYC2 CZD3 CZB3 AfC WEE

1 000 FEET

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 67

(67)

N

(Joins sheet 59)

(Joins sheet 66)

(Joins sheet 68)

(Joins sheet 73)

Toblers Mill

Andrews Chapel

Scale 1:15,840

(68)

N

(Joins sheet 60)

(Joins sheet 67)

(Joins sheet 74)

Scale 1:15,840

1 Mile

5,000 feet

Cunningham School

New Hope Church

Yatesville

SOUTHERN

LOG TOWN ROAD

MONROE COUNTY

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 68

(Joins inset, sheet 62)

(Joins sheet 63)

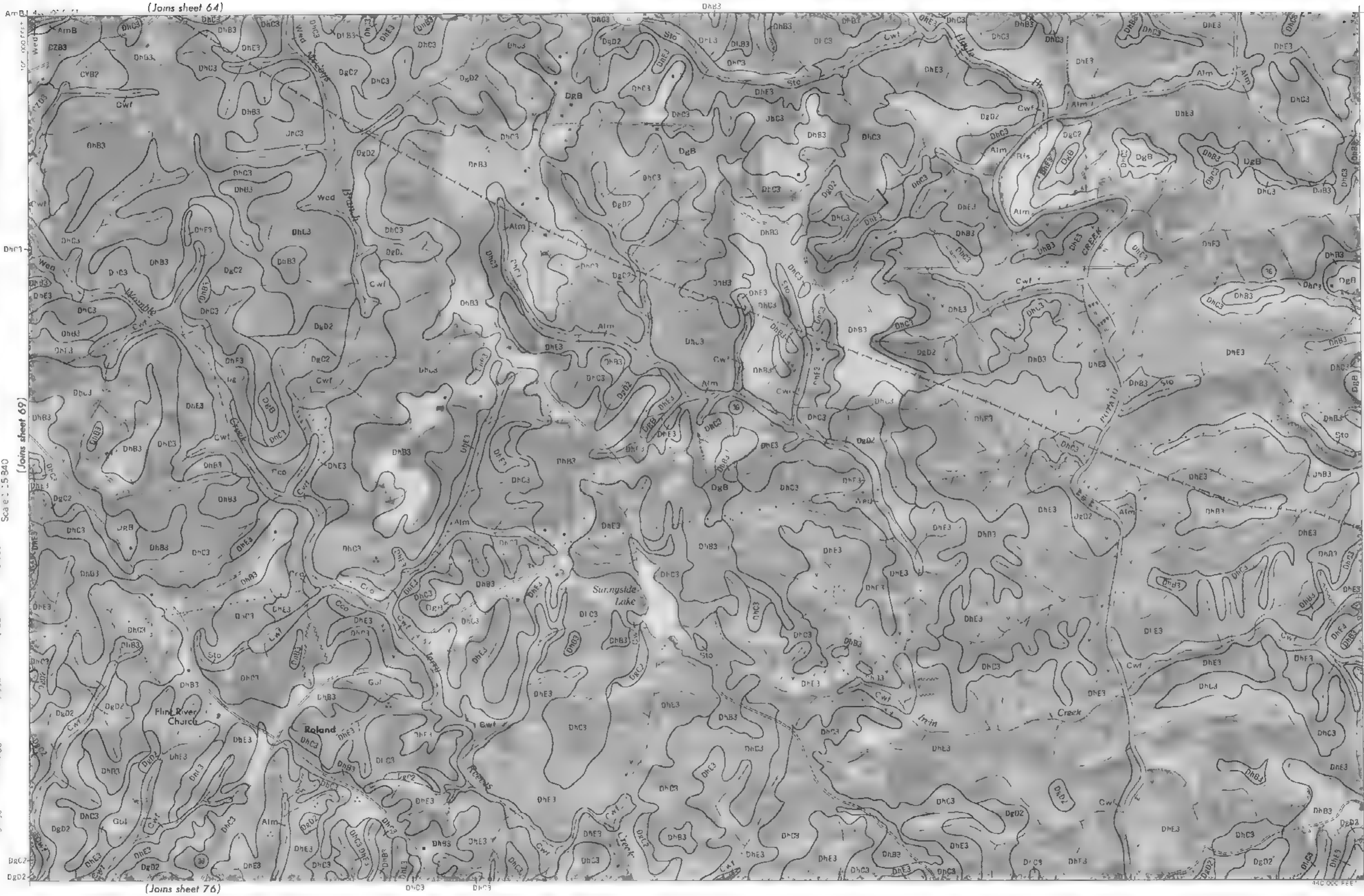
(Joins sheet 70)

(Joins sheet 75)

N

Scale 1:15,840

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 69


(Joins sheet 64)
(Joins sheet 69)
(Joins sheet 71)
(Joins sheet 76)
N
Flint River Church
Roland
Sunnyside Lake
Womble Creek
Buffalo Creek
Creek
Irvin
Reeves
Branch
LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 70

(Joins sheet 65)

(71)

N

THOMASTON
(county seat)

Thomaston School

LINCOLN PARK

Arrowhead Lake

Bryans Mill Road

Wymanville

Alm Branch

Bell Town

(Joins sheet 70)

(Joins sheet 72)

(Joins sheet 77)

1 Mile

5,000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1 Mile

0 1,000 2,000 3,000 4,000 5,000 Feet

...UNTIES, GEORGIA NO. 71

...ed on ... and ... surveys by the United States Department of Agriculture ... Georgia Experiment Stations

... 1927, North American datum

(72)

(Joins sheet 66)

1 460 000 FEET

1051 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 71)

(Joins sheet 73)

(Joins sheet 78)

1038 000 FEET

480 000 FEET

Emorys Chapel

Armuchee Lake

Peaceful Valley Church

TRYUNE MILL ROAD

WYMANVILLE ROAD

Photobase from 1965 aerial photographs. Grid values based on Georgia plane coordinate system west zone 1927 North American datum

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture Soil Conservation Service and the University of Georgia College of Agriculture Agricultural Experiment Stations

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 72

(Joins sheet 67)

(Joins sheet 72)

(Joins sheet 74)

(Joins sheet 79)

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 73

73

N

Scale 1:15,840

74

N

(Joins sheet 68)

(Joins sheet 73)

(Joins sheet 80)

Scale 1:15 840

1 M

5000 Feet

MONROE COUNTY

ARNOLD CEMETERY

KENDALL

ROAD

Creek

Little

Arachuwhee

Wed

Cwf

Alm

Sto

LOG

TOWN

ROAD

Drained

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 74

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 75

N

(Joins sheet 69)

(Joins sheet 76)

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 75

Scale 1:15 840

0 1/4 1/2 5/8 1 Miles

0 1000 2000 3000 4000 5000 6000 Feet

TALBOT COUNTY

FLINT RIVER

Owens Creek

Reeves Creek

Seven Islands

(Joins sheet 70)

(Joins sheet 75)

(Joins sheet 81)

(Joins sheet 77)

N

Scale 1:15 840

1 000 Feet

Reeves Creek

Cwf

DhE3

DgD2

DhC3

DhB3

Cco

Bfs

Sto

Gul

Ifs

Ivy

WYNNS BRIDGE

PLANT TALBOT COUNTY

TALBOT COUNTY

Yellow Jacket Shoals

Shelly Island

Gibson Island

Jerry Reeves Creek

Atm Creek

POTATO CREEK

CYE2

CYC2

CZD3

CZB3

PkC3

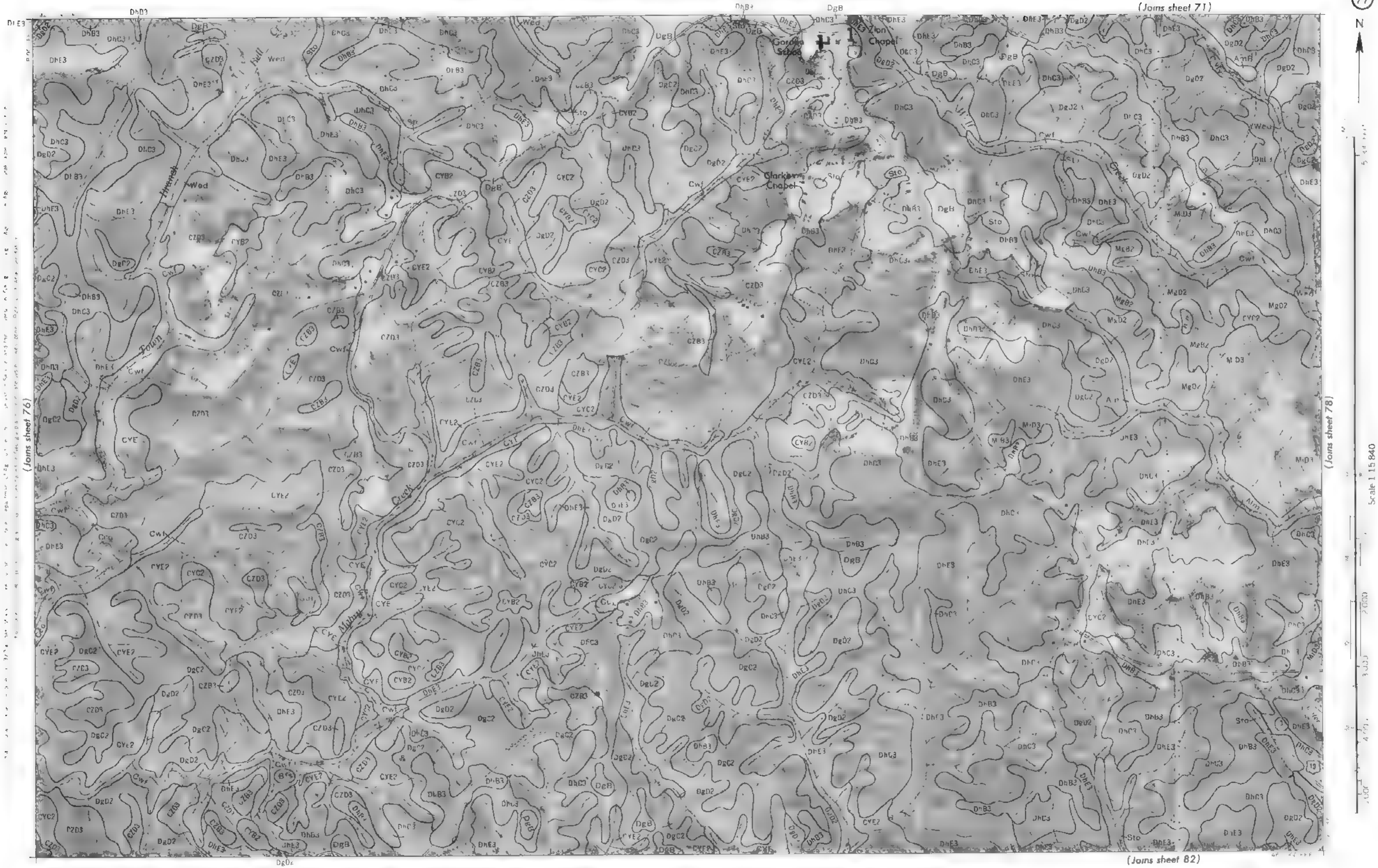
DgB

DgC2

UgC2

Prepared by Soil Conservation Service and the University of Georgia College of Agriculture Experiment Stations

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NO. 76


77
(Joins sheet 71)
(Joins sheet 76)
(Joins sheet 78)
(Joins sheet 82)
N
Scale 1:15 840
Zion Chapel
Clarks Chapel
Town
Branch
Creek

78

N

(Joins sheet 72)

(Joins sheet 77)

(Joins sheet 79)

(Joins sheet 83)

Scale 1:15 840

1 Mile

5,000 Feet

Peaceful Valley Church

New Harmony Church

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NO. 78

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 79

N

(Joins sheet 74)

(Joins sheet 79)

(Joins sheet 85)

MONROE COUNTY

CRAWFORD COUNTY

INDEPENDENT BOUNDARY

Little Bryant Branch

Little Wed Creek

Tuckahumpkee Creek

Watson Br

Scale 1:15 840

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 80

(Joins sheet 76)

420 000 FEET

(81)

N

Highwater Shoals

Hickman Bfs. Island

FLINT RIVER

TALBOT COUNTY

CYPRESS CREEK

POTATO

Adams Island

(Joins sheet 82)

(Joins lower right)

(Joins sheet 86)

440 000 FEET

(Joins upper left)

Scale 1:15 840

1 0 1 MILE

1 0 1 2 KILOMETERS

This map is one of a set compiled 1940 as part of a soil survey by the United States Department of Agriculture College of Agriculture Experiment Stations Soil Conservation Service and the University of Georgia
Field base is 1927 North American datum and values based on Georgia plane coordinate west zone
Topography compiled 1937

N

1 Mile

5,000 Feet

Scale 1:15,840

(Joins sheet 77)

(Joins sheet 81)

(Joins sheet 83)

(Joins sheet 86)

Pleasant Grove Church

Dean Creek

FLINT RIVER

TALBOT CO

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 82

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 83

(Joins sheet 78)

(Joins sheet 82)

(Joins sheet 84)

(Joins sheet 87)

83

N

Scale 1:15 840

1 Mile

1 000 Feet

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 84

(84)

N

(Joins sheet 79)

(Joins sheet 83)

(Joins sheet 85)

(Joins sheet 88)

Scale 1:15,840

1 Mile

5,000 Feet

Hinsley Branch

Auchumpkee Creek

Little Auchumpkee Creek

Auchumpkee Creek

EBENEZER CEMETERY

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 84

N

500,000 FEET

(Joins sheet 80)

(Joins sheet 84)

(Joins upper right)

(Joins lower left)

(Joins sheet 88)

CRAWFORD COUNTY

Pleasant Hill Church

PLEASANT HILL CEMETERY

SHELD CEMETERY

INDEFINITE BOUNDARY

Auchumpkee

Gut

Sto

Cwf

WLC

Scale 1:15,840

5,000 Feet

1,000 0 2,000 4,000 6,000 8,000 Feet

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 85

(Joins sheet 82)

(Joins inset, sheet 81)

(Joins sheet 87)

N

Scale 1:15 840

5 000 Feet

TALBOT COUNTY

FLINT RIVER

Stripes Shoals

This map was compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Agricultural Experiment Station, College of Agriculture, University of Georgia.

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 87

(Joins sheet 83)

460 000 FEET

1012 000 FEET

(Joins sheet 86)

(Joins sheet 88)

(Joins sheet 89)

480 000 FEET

999 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 1 000 2 000 3 000 4 000 5 000

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 87

This map is one of a set compiled in 1976 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.
Photobase from 1965 aerial photographs. Grid values based on Georgia plane coordinate system, west zone. 1927 North American datum.

FLINT RIVER

TALBOT COUNTY

TOLLER CREEK

MICHAMMEE

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 88

88

N

Scale 1:15 840

1 Mile

5 000 Feet

0 0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

480 000 FEET

1012 000 FEET

(Joins sheet 84)

(Joins sheet 87)

(Joins sheet 90)

(Joins inset, sheet 85)

500 000 FEET

999 000 FEET

CONFEDERATE ARMY CEMETERY

Salem Church

B.P. HICKSON CEMETERY

BORROW PIT

CRAWFORD COUNTY

Auchumpkee Creek

Potash Branch

Rum Creek

Photobase from 1965 aerial photographs. Grid values based on Georgia plane coordinate system, west zone. 1927 North American datum.

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 88

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA — SHEET NUMBER 89

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 89

This map is one of a set compiled in 1970 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations.
Photobase from 1965 aerial photographs. Grid values based on Georgia plane coordinate system, west zone, 1927 North American datum.

(89) N

(Joins sheet 87)

(Joins sheet 90)

(Joins sheet 90)

1 Mile
5 000 Feet
Scale 1:15 840

90

N

480 000 FEET

999 000 FEET

(Joins sheet 88)

(Joins sheet 89)

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

Photobase from 1965 aerial photographs. Grid values based on Georgia plane coordinate system, west zone. 1927 North American datum.

This map is one of a set compiled in 1971 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations

LAMAR, PIKE, AND UPSON COUNTIES, GEORGIA NO. 90

986 000 FEET

500 000 FEET

(Joins inset, sheet 89)